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"That's a Big Bad Wolf!": Learning through Teacher-Child Talk During Shared Reading of a Story Book App

Michelle M. Neumann[1] · **Guy Merchant**[2]

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Abstract
Touch screen tablets and story book apps provide opportunities for teachers to support young children's shared reading experiences. Much research has examined the benefits of digital book reading in children's learning. However, less is known about how very young children engage with and learn from interactive story book apps and how teachers support these early reading experiences. The case study reported on here was conducted in the north of England and explored how one teacher scaffolded a young child's learning and interactions during shared reading of a story book app (*Three Little Pigs*) in her early years classroom. The teacher used a wide range of words, repetition, and questioning strategies to engage the child with the story content and maintain her interest which provided a positive experience for the child. The teacher also offered encouragement and technical assistance to scaffold learning. These important teacher supports afforded opportunities for the child to learn about language and literacy in meaningful ways with a digital device. This generates practical recommendations on how early childhood teachers can effectively engage young children with story book apps in the classroom.

Keywords Young children · Teacher · Shared reading · Story book apps · Scaffolding · iPads · Digital books

Introduction

It is well established that young children are using touch screen tablets daily to watch YouTube videos and play games (Brito, 2016; Merchant, 2021; Rideout, 2017). These mobile devices have screens that allow apps to be selected with the simple tap of a finger, making them easy for children to use. The multimodal features of apps (i.e., colours, sounds, interactive animations) and the immediate feedback they provide attract the attention of young children. Although it is important that young children engage in a balanced range of stimulating indoor and outdoor activities that support physical, cognitive, and social-emotional development, digital devices can have a role to play in literacy and language development (Neumann, 2020a). Currently, it is recommended that when engaging in active screen media activities children do so with others (family members, carers, teachers) using age-appropriate quality apps and video chatting (American Academy of Paediatrics, 2016). Digital devices can also be used for adult-child shared reading activities (Kucirkova et al., 2014; Merchant, 2015). From a socio-cultural perspective (Vygotsky, 1978), shared reading experiences are defined as "an interactive and scaffolded reading experience, in which the adult operates as a facilitator of children's meaning making from texts" (Hoffman & Paciga, 2014, p. 380). Research in this tradition has underlined the benefits of shared book reading (Bus et al., 1995; Teale, 2003) and is largely concerned with print literacy. Less is known about shared reading with digital applications (apps) with very young children, although it is widely accepted that digital experiences can increase opportunities for children to learn about their world and develop their language and communication skills (Plowman & McPake, 2013).

Story Book Apps

In addition to the increased availability of educational apps (such as those that promote alphabet matching, drawing/painting) and online resources (such as YouTube videos of nursery rhymes and storytelling) there is a plethora of story book apps (also known as e-books, apps, picture book apps,

✉ Michelle M. Neumann
m.neumann@griffith.edu.au

[1] School of Education and Professional Studies, Griffith University, Queensland, QLD 4222, Australia

[2] Sheffield Institute of Education, Sheffield Hallam University, Sheffield, UK

or digital books; Kucirkova, 2019). The content of digital books for young children includes a range of texts such as cultural stories, information-narratives, non-fiction texts and poetry, where diverse text-based language can be experienced (Campbell & Neumann, 2020). It is well established that sharing stories with young children in rich ways is an important and powerful way to enhance their knowledge about the world they live in (Simsek & Işıkoğlu Erdoğan, 2020; Wells, 1986; Wong & Neuman, 2019). Shared story book reading also provides a naturalistic context for supporting young children's language development (Dickinson & Smith, 1994; Hargrave & Senechal, 2000) and word learning (Lowman et al., 2018; Snell et al., 2015).

It is now becoming clear that digital books and story book apps that are well designed in terms of their interactivity, animations, multimedia effects, texts, words, audio narration, music and sounds can provide shared reading opportunities for young children to foster reading enjoyment and vocabulary development (Korat & Shamir, 2012; Roskos et al., 2012). Story book apps with animated illustrations that can be touched and changed through physical gestures such as tapping, swiping, and dragging characters and objects across the screen have the potential to increase children's engagement and interest in reading (Aliagas & Margallo, 2017). It is proposed that these interactive experiences could lead to greater understanding of story content, context, and characters (Son et al., 2020).

Several studies have already been conducted on the use of digital books to support early literacy development in pre-schoolers aged 3 to 5 years (Reich et al., 2019; Rhoades, 2016) and research has shown that some children prefer digital stories, perhaps because their multimedia features lead to greater engagement and repeated readings of the story (Richter & Courage, 2017). Son et al. (2020) reported that interactive illustrations in story book apps fostered kindergartners' (aged 5–6 years, $N = 45$) comprehension skills and promoted recall of the narrative when these animations were directly related to the story content. Some advantages of using touch during tablet use have been found to support creativity and explorative experiences and assist in recalling story events (Harwood et al., 2015).

However, some researchers have suggested that the manipulative features (or hotspots) in digital books may be a distraction and place an increased burden on young children's cognitive load, hindering comprehension (de Jong & Bus, 2002; Tare et al., 2010). These potential distractions could be minimised by ensuring story book apps for young children are carefully designed for learning containing appropriate visual animations that compliment other aspects of the text. For example, when the animation helps with word meaning or expands on characterisation and the audio (e.g., words spoken, music and sounds) and text are well aligned with the story narrative (de Jong & Bus, 2003; Korat & Shamir, 2004). As such, Son et al. (2020) highlight the importance of teachers selecting quality story book apps based on literacy and language abilities to ensure that the text and content is appropriate for young children.

Shared Reading

In contrast to research work on pre-schoolers and primary school students, considerably less is known about how story book apps are being used by early childhood teachers to support toddlers' shared reading experiences and language learning in the classroom (Şimşek & Işıkoğlu Erdoğan, 2020). From a socio-cultural perspective (Vygotsky, 1978), shared story book reading is an active collaborative experience for young children when a teacher supports a child's understanding of new words. This support is provided through *teacher talk* which is defined as verbally conversing or communicating with spoken words. This teacher-child dialogue can facilitate young children's language learning and vocabulary (Gest et al., 2006; Hindman et al., 2019; Paatsch et al., 2019). For example, teacher talk that includes comments, directives, remarks, and questions about the story that are asked just above children's current abilities, has the potential to extend young children's knowledge and understanding about language (Deshmukh et al., 2019; Kucirkova, 2019; Walsh & Hodge, 2018). Teacher use of questions during shared book reading has also been found to enrich conversations that support language learning (Wasik & Bond, 2001). However, limited research has been conducted in the early childhood classroom setting, to explore teacher talk and the use of questions (Deshmukh et al., 2019) to scaffold young learners during shared book reading experiences with digital books.

Scaffolding

Provision of scaffolding during shared story book reading of digital books (Hoffman & Paciga, 2014; Milburn et al., 2014) can support young learners. Scaffolding is defined as verbal or non-verbal assistance by more knowledgeable others (teachers and parents) that acts to support children's participation in a task (Masters & Yelland, 2002; Rodgers, 2004; Wood et al., 1976). Scaffolding enables and extends a child's learning within their Zone of Proximal Development (Vygotsky, 1978). When the child has mastery, the scaffolding can be removed to allow the child to apply their learning independently (Ankrum et al., 2014). In terms of shared reading of digital books such as story book apps, three types of scaffolding have been identified that can support children's learning and interactions during a shared book reading experience. These are *Cognitive scaffolding* (questions asked by the teacher about the story content, e.g., Tell me what happened to the mouse?), *Affective scaffolding*

(positive feedback and encouragement, e.g., Yes that's right, have a go!) and *Technical scaffolding* (operation and navigation of the digital book, e.g., Tap the arrow to go to the next page) (Neumann, 2017; 2020b; Yelland & Masters, 2007).

Examples of scaffolding can be seen in a study conducted by Merchant (2015) who described two story book app shared reading episodes with an adult and three young children aged 14 to 22 months in an early years classroom. These episodes were video recorded and analysed to explore hand and body gestures used and material affordances of story book apps on iPads. The story book apps selected were *The Three Little Pigs* and *Peppa Pig's Party*. The hand and body movements included holding the iPad to stabilise it, tapping, swiping, pointing and directing children's attention to the story playing on the screen. The adult modelled body and hand movements to a 14-month-old toddler, who sat on the adult's lap on the floor. The adult showed the child how to turn the pages on the screen with her finger and point to words on the screen such as "Read" whilst saying, "You can read it". To engage the children, the adult talked with the children and asked questions about the story content [cognitive scaffolding] such as, "Where's that Peppa?"; and gave directions ("Watch this little pig"), and provided positive encouragement ("Good Boy!") [affecting scaffolding]; and operational assistance ("You press just there, look") [technical scaffolding]. These examples of the adult's gestural and physical movements and verbal talk to scaffold young children's learning during shared story book app interactions in this early years centre resulted in meaningful and authentic child learning experiences with words and language.

The Present Study

Due to the popularity and increasing use of tablets and apps by young children (Miller et al., 2017; Kucirkova, 2019) in early years settings, it is important to further explore how teachers verbally scaffold young children's learning during shared reading experiences with story book apps. By providing opportunities for linking text to a child's experience and personal knowledge, shared reading can support the development of comprehension skills, but sensitive adult support may be needed (Korat et al., 2017). Increasing our understanding of how a book is shared with a young child is important, since the types and quality of shared reading interaction associated with language and literacy development may vary (Walsh & Hodge, 2018; Şimşek & Işıkoğlu Erdoğan, 2020). Such information will help inform how best to scaffold shared reading with story book apps to foster early learning (Decat et al., 2019).

The present case study aims to extend previous research (Merchant, 2015; Neumann, 2017) by exploring how one classroom teacher engaged and scaffolded a young child's learning during a shared reading experience with a story book app. The following were explored:

1. How does a teacher scaffold a young child's learning during shared reading of a story book app?
2. What practical strategies can be provided to teachers to scaffold shared reading of story book apps with young children in an early years classroom?

Method

This present case study was conducted in one early years centre in the north of England and draws from a week-long small-scale research project that explored young children's interactions with iPads. This centre was an English-speaking local nursery school with approximately 150 children aged from 0 to 5 years. The project was approved by the University Ethics Committee and informed consent was provided by the early years centre manager, teaching staff, and parents for three researchers to observe children interacting with tablets during their regular classroom activities. The researchers were qualified and experienced early literacy experts. They worked together in the classrooms to generate fieldnotes and video observation data of children's interactions with iPads.

The study's method used naturalistic observation with no direct intervention or interference by the researchers in the classroom. The main aim of the research was to discover key themes and build a rich picture and narrative of how children were interacting with and using tablets in their classroom. As the study was short, the aim was not to collect demographic information of children or histories of children's iPad use but simply to observe what the teachers and children were doing with iPads and how they were taken up by young children in this early years setting. Through this approach it was possible to explore what was happening in the moment and what teacher actions helped produce what children did with iPads.

On day four of the study, the three researchers spent the morning observing teacher and child interactions with iPads in the toddler classroom over a two-hour period. There were seven toddlers (aged 1 to 2 years old; 4 girls, 3 boys) and two teachers in the classroom. A basket of six iPads was made freely available and children were encouraged to collect an iPad from the basket if they wished. The iPads had been installed with educational apps (Peppa Pig, Endless ABC, Puppet Pals, Nighty Night, and Three Little Pigs) and were provided to the children who were free to play with them in any way they liked alongside their usual classroom toys and play items.

The present study focussed on one episode in a morning play session where two-year-old child Lily (pseudonym) and her teacher were observed reading a story book app on an

iPad. The teacher was not prompted in any way to read a story book app with Lily and this iPad activity was spontaneously initiated by the child. The app Lily selected on the iPad was the *Three Little Pigs* app (Nosy Crow, 2016). This story book app contains multimodal elements such as animated characters, musical sounds, and brightly coloured objects and landscapes that stimulate children's auditory and visual senses. Children can interact with elements of each page of the story, for example by tapping the arrow to turn the page, blowing into the microphone to blow the pig's house down, flicking characters with fingers to make them speak or jump, or tilting the iPad to show more of the fairy tale scene on the screen.

Lily sat on her teacher's lap on a comfortable mat on the floor as the researcher video recorded the shared reading experience from behind the teacher and child, so that researcher was not in their view. The teacher and Lily communicated in English during the shared book reading observation. The teacher put her left arm around Lily and held the iPad with her right hand and they both looked at the app as it opened. Lily pointed to the screen with her index finger. The shared reading video recording began when the teacher said, "Which one, which one?" and Lily tapped the 'Read to Me' button and the screen opened with the Big Bad Wolf character in a forest scene as the app narrator reads the *Three Little Pigs* story. Teacher-child talk continued until the shared reading experience ended when Lily was called by another teacher to have her morning tea. Lily hopped off her teacher's lap and ran across the room to have her milk and biscuits at a table with the other children in her class.

The video recording of this spontaneous shared reading experience with a story book app lasted 19 minutes. The verbal exchanges between the teacher and child were transcribed. The talk the teacher used to scaffold the child during shared reading of the story book app was analysed in terms of its particular characteristics such as the use of specific words, repetitions, and questions to explore how the teacher engaged the child in conversations and maintained her interest. The frequency of words uttered by both the teacher and child per minute were calculated and analysed.

Findings

General Observations

This spontaneous teacher-child interaction lasted for 19 minutes during which time the adult used a range of verbal exchanges that supported their shared reading of the interactive story book app, *The Three Little Pigs*. The teacher performed actions and behaviours of the characters. For example she said, "He's going to blow the house down!" and "He's huffing and puffing" whilst physically blowing onto the screen just like the animated big bad wolf in the story. Their joint interaction and enjoyment were demonstrated when the teacher and child laughed together at the animated big bad wolf and other story characters (e.g., pigs, rabbits, spiders) depicted in the various woodland scenes. The way in which the teacher responded to Lily was based on Lily's personal interests, choice of button selection, and attention towards certain elements during the story. For example, Lily pointed to a pig on the screen then the teacher asked, "Is that mummy pig?". This demonstrated how the teacher freely allowed interactions with the iPad to be initiated and led by the child.

Teacher and Child Use of Words

During the 19 minutes of digital shared story book reading, the total number of words uttered by the teacher was 747 (39.31 words/ min) and Lily uttered 50 words (2.67 words/ min). Although the teacher contributed a greater number of the words to the shared book reading experience compared to the child, joint attention was sustained. The teacher's most frequently uttered words were: Oh [23 times], house [15 times], Lily [14 times], going [14 times], and big [11]. "Oh" was used on several occasions by the teacher to express feelings related to the story content and relay her emotions such as surprise, anger, disappointment, or joy, and which emphasised the dramatic tension of the story. For example, the teacher pointed to the screen page where the wolf was coming towards the pigs and pretended to be scared by holding her hand to her mouth saying, "It looks a bit scary, Oh no, Oh no!"

The most frequently uttered words by Lily were: doggy [8 times], that's [7 times], Lily [4 times], big [4 times], and daddy [3 times]. Lily used the word "doggy" to refer to the wolf, however, the teacher responded by providing an alternative and more sophisticated word for "doggy" to better fit the context of the story. For example, Lily pointed at the wolf with her finger on the screen then exclaimed, "That's doggy!" "That's doggy!" The teacher nodded in agreement and followed with saying, "That is the *big bad wolf*, oh he looks a bit cross!". The teacher's response acknowledged Lily's word "doggy" but also extended her learning by introducing a new word, "wolf", to Lily's vocabulary. In total, the teacher corrected the word 'doggy' with 'wolf' five times, during the shared story book reading. There was no instance found during the shared reading where Lily independently said the word wolf. The rich range of words uttered by the teacher and Lily can be seen in Figs. 1 and 2 respectively, visually represented in the word clouds. The larger the font size indicates that a certain word was used more frequently during the shared reading experience. Note that words such as the, and, to and so were excluded from the word frequency counts so that relevant words that were

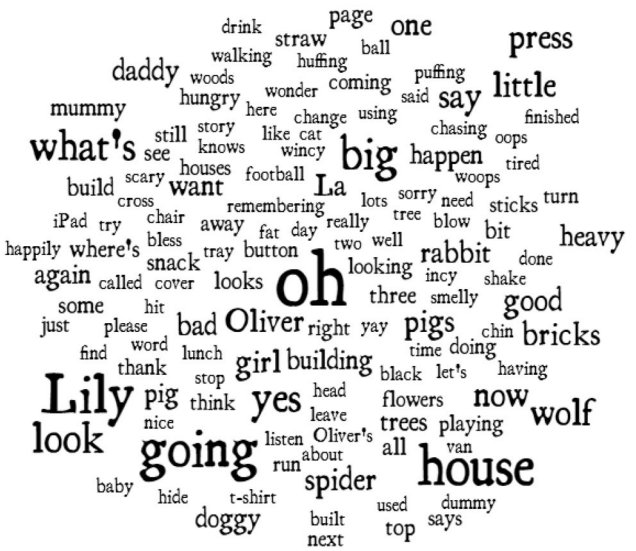

Fig. 1 Words the teacher uttered

Fig. 2 Words Lily uttered

used by the teacher and child could be highlighted. In addition, the teacher also used descriptive words such as "big" and repeated them to extend understanding and familiarity with the word. For example, Lily pointed to a tree and said, "trees" and the teacher responded enthusiastically by saying "Yes, big trees, big trees".

The range of words the teacher uttered during the shared digital book reading are presented in Table 1. They consisted of words used by the teacher to support learning about the story content (e.g., wolf, heavy); words used to positively encourage Lily's engagement with the story book app (e.g., good, yes); and words used to provide navigational support when using the iPad and app (e.g., button, press). In addition, there were also some "other" words (e.g., snack, flowers) the teacher uttered that were not directly related to the story content (see Table 1).

Table 2 shows the words uttered by Lily that were related to the story content and two words that were not relevant to the story content (e.g., cats, chair). For example, when momentarily, Lily looked at the T-shirt she was wearing and patted her T-shirt with her hands and said "cats". The teacher responded by saying "You've got a cat on your T-shirt, haven't you?" The teacher then re-engaged Lily with the story by pointing to the screen to redirect her visual attention and said, "There's a little rabbit on there". Most of the words the teacher uttered were used to support Lily's cognitive understanding of the story content.

Word Repetition

The words the story book app narrator said were sometimes repeated by Lily and her teacher. Such digital affordances of the story book app, stimulated teacher-child talk and provided opportunities and ideas for the teacher to extend their conversations. The teacher's use of word and phrase repetition was also evident through the shared reading. For example, Lily said, "Big bad" and the teacher repeated "Big bad wolf" or Lily said, "Bricks!" and pointed to the house on the screen and the teacher immediately replied, "Brick! Yes!". These teacher-child interactions demonstrate how the teacher positively supported Lily's interest and engagement with the story's digital content and the multimodal elements of the app. This use of teacher repetition to support learning about words such as "houses" and "bricks" is seen in the example below:

> Story book app narrator: "The third little pig decided to build a house made out of bricks. He worked hard and his house took a long time to build".
> Teacher: "Oh look, lots of bricks, heavy bricks". (Lily pointed to the bricks on the screen).
> Teacher: "Heavy, heavy bricks". (The teacher pointed to the bricks on the screen).
> Lily: "Heavy bricks".
> Teacher: "Heavy bricks, yes good girl".
> Teacher: "She's going to build her house, build a house".
> Lily: "Big house".
> Teacher: "A big house, big house"
> Lily: "Bricks!" (Lily pointed to the bricks on the screen again).
> Teacher: "Bricks, yes!"

Teacher's Use of Questions

The teacher asked Lily factual and recall questions using different sentence starters (e.g., is, what, where). The teacher asked a total of 58 questions (on average three questions per minute) throughout the 19 minutes of the shared reading experience to engage Lily's interest and facilitate interactions with the parts of the story content. The teacher asked Lily questions

Table 1 Words uttered by the teacher

Words the teacher uttered to support learning about the story content				Words the teacher uttered for encouragement	Words the teacher uttered for technical support	Other words the teacher said not related to the story content
oh [23]	daddy [5]	houses [2]	can't [1]	Lily [14]	press [7]	girl [1]
house [15]	heavy [5]	hungry [2]	change [1]	yes [10]	page [3]	want [3]
going [14]	la [5]	just [2]	chasing [1]	girl [5]	top [3]	snack [3]
big [11]	rabbit [5]	looking [2]	chin [1]	good [6]	button [2]	flowers [2]
he's [10]	building [4]	playing [2]	cover [1]	want [2]	right [1]	thank [2]
what's [10]	doggy [4]	run [2]	cross [1]	right [1]	turn [2]	bless [1]
look [10]	happen [4]	says [2]	day [1]			cat [1]
that's [8]	pig [4]	sticks [2]	fat [1]			drink [1]
wolf [8]	bit [3]	there's [2]	finished [1]			dummy [1]
isn't [7]	build [3]	think [2]	football [1]			
little [7]	looks [3]	aren't [1]	happily [1]			
say [7]	mummy [3]	baby [1]	having [1]			
bricks [6]	shall [3]	ball [1]	head [1]			
it's [6]	straw [3]	black [1]	hide [1]			
Oliver [6]	where's [3]	blow [1]	hit [1]			
pigs [6]	away [2]	built [1]	huffing [1]			
she's [6]	coming [2]	called [1]	incy [1]			
spider [6]	doing [2]					
bad [5]	haven't [2]					

[brackets] indicates number of instances that word was said in the 19 minutes of shared digital reading experience

Table 2 Words uttered by the child

Words the child uttered related to the story content				Words the child uttered not related to the story content
doggy [8]	black [2]	heavy [1]	trees [1]	cats [1]
that's [7]	bricks [2]	house [1]	where's [1]	chair [1]
Lily [4]	Oliver [2]	mummy [1]	yeah [1]	
big [3]	spider [2]	tired [1]	yes [1]	
daddy [3]	bad [1]			

[brackets] indicates number of instances that word was said in the 19 minutes of the shared digital reading experience

about the characters ("Are they walking in the woods?"), story events ("Is he building a house with straw?"), and to extend thinking ("What is going to happen?"). The teacher also used questions to guide the child's navigation through the story book app ("Shall we press the button to see the next one?"). The teacher used 11 question starter words (is, what, do, are, where, which, have, shall, who, did, should) to begin questions during the shared story reading. The number of instances each question starter word was used can be seen in Table 3. The teacher was observed to begin most of her questions with the words "is" and "what". There were no "when" or "why" questions asked by the teacher during the shared story book reading. During the 19 minutes of shared reading of the story

Table 3 Questions asked by the teacher

Question starters	Number of times a question starter was used by the teacher	Examples
Is	[19]	"Is that the baby pig?"
What	[18]	"What's going to happen next?"
Do	[5]	"Do you want to press the button?".
Are	[4]	"Are the pigs going to run away?"
Where	[3]	"Where's he going to stop for his lunch?"
Which	[2]	"Which one?
Have	[2]	"Have you got some flowers as well?
Shall	[2]	"Shall we have a look?"
Who	[1]	"Who was the little rabbit?
Did	[1]	"Did the pig run away?"
Should	[1]	"Should we turn the page again?"

book app, Lily asked her teacher only one question ("Where's Oscar?") when referring to one of the three animated pigs playing with their family.

Examples of the teacher's use of questions are presented below:

Lily: "That doggy." "That doggy." (Lily pointed to the wolf on the screen).
Teacher: "Is that daddy?" "The big bad wolf" "Or is this daddy?" (The teacher pointed to another character on the screen).
Teacher: "She's got daddy, mummy, and Lily as the pigs."
Teacher: "Who was the little rabbit?" "What was the little rabbit called?"
Teacher: "It looks a bit scary, Oh no, Oh no!" (The teacher pointed to the screen and pretended to be scared by holding her hand to her mouth).
Teacher: "What's going to happen? Are the pigs going to run away?" "Did the pig run away?" "Have a look".

Types of Scaffolding

The teacher was observed to provide three types of verbal scaffolding during the shared reading of the story book app. *Cognitive scaffolding* occurred when the teacher referred to an aspect of the story content (e.g., "He's building his house with straw"). *Affective scaffolding* occurred when the teacher provided feedback or encouragement (e.g., "Good girl you are remembering"). *Technical scaffolding* occurred when the teacher assisted with the operation or navigation of the story book app (e.g., "Press the word for what to say). Examples of each type of teacher scaffolding [*cognitive*], [*affective*], and [*technical*] are provided below:

Cognitive Scaffolding

An example of where the teacher scaffolded Lily's cognitive understanding of the words related to the story content is seen below when she used the words "big", "bad", and wolf". The teacher also used a range of question starters such as "is" and "what" to introduce new words and to allow Lily to verbally respond and share her thoughts and ideas.

Story app narrator: "It's the big bad wolf" [cognitive].
(The animation on the screen showed the wolf driving his van into the woods looking for the pigs to eat for his lunch).
Teacher: "Oh, look at that the big bad wolf!" [cognitive].
Lily: "That doggy!" (Lily pointed to the wolf on the screen).
Lily: "That doggy!"
Teacher: "Is it a wolf? The big bad wolf" [cognitive].
Teacher: "Press the word for what to say".
Lily: "Big bad"
Teacher: "Big bad wolf". "Good girl".
Teacher: "In his van" [cognitive].

Affective Scaffolding

In addition to providing affective scaffolding with words such as "good girl", the teacher also provided support with words such as, "Yes, you can do it!" to help engage and encourage Lily's participation and interactions with the story content and app's interactive features.

Lily: "Big bad"
Teacher: "Big bad wolf". (The teacher nodded her head).
Teacher: "Good girl" [*affective*]. "In his van".
(Lily attempted to press a picture on the screen).
Teacher: "Yes you can do it" [*affective*]. (The teacher nodded).
Teacher: "Press his chin." (Lily pressed the wolf on the screen).
Story app narrator: "I wonder where I will stop for lunch."
Teacher: "Where's he going to stop for his lunch?"
Teacher: "I wonder what Oscar's got to say?" (Lily tapped the character).

Technical Scaffolding

Provision of technical scaffolding by the teacher was evident, for example when Lily attempted to press the wolf on the screen and the teacher said, "Press his chin". Then Lily successfully pressed the picture of the wolf character on the screen. The teacher also used the word "press" to guide Lily's finger to the right place on the screen to turn the page or tap on a character which is seen in the example below.

Teacher: "Shall we press the button to see the next one?" [*technical*]
(The teacher pointed to the right arrow on the page then Lily pressed it with her finger to turn the page).
Teacher: "Oh look all the houses!" (The teacher points to the pigs' three houses on the screen).
Story app narrator: "The pigs lived happily in their three houses."
Teacher: "One, two, three."
Teacher: "Three houses."

Discussion

With increasing use of touchscreen tablets such as iPads in early years classrooms, it is important to understand how teachers support very young children's language and literacy

learning during shared reading of story book apps. This is because these skills provide the foundation for children's future learning and reading success. The present case study used observational data to understand how one teacher engaged and scaffolded a young child's interactions with a story book app (*The Three Little Pigs*) on an iPad. The teacher used verbal exchanges, questioning, and word repetition to support the child's understanding of the story content (*cognitive scaffolding).* She encouraged and provided feedback to engage the child during the shared reading experience (*affective scaffolding*) and assisted the child with navigating through the interactive elements of the story book app (*technical scaffolding*).

The positive experience of the child that was observed in the present study aligns with previous research showing that children enjoy reading stories on iPads because they capture attention and interest (Richter & Courage, 2017; Ghalebandi & Noorhidawati, 2019). The teacher-guided use of multimodal features of the story book app (audio, animations), provided the child with autonomy, choice, and agency. This was reflected in the child's interest, motivation and engagement during the shared story book reading session. This finding is supported by Reich et al.'s (2019) iPad study where 3 to 5-year-old children ($N = 200$) became emotionally and behaviourally engaged in the digital shared reading experience because the adult sensitively supported their understanding of the story.

In the present study, the teacher's comments, and questions (e.g., What is going to happen?) offered during the shared reading with the story book app were useful in scaffolding the child's interactions with the story and helped prompt the child to respond. Such teacher-child talk provided Lily with opportunities to learn new words within a meaningful context and share her ideas. This approach during shared book reading positively supports early learners (Deshmukh et al., 2019). Furthermore, the teacher in the present study provided questions within the child's Zone of Proximal Development to ensure the verbal scaffolds were at just the right level to engage Lily but not be over challenging, frustrating, or impede teacher-child talk. For example, the teacher responded to Lily's use of the word "doggy" by saying the new word "wolf" five times during the shared reading experience. Lily's use of the word "doggy" indicates her ability to make meaning and link the text to her experience and understanding. However, Lily was not observed to say the word "wolf" independently at any time during the book reading. Although speculative, it is possible that Lily may still need further scaffolding within her Zone of Proximal Development by her teacher to extend her knowledge and articulation of the word "wolf". To further scaffold young children's learning of new vocabulary with multimodal story book apps, encouraging children to ask more questions about what they are hearing and seeing on the screen has the potential to help strengthen their understanding and use of new words (Deshmukh et al., 2019; Hoffman & Paciga, 2014).

Practical strategies

During shared reading of story book apps with young children, it is important to provide support for understanding of the story content and use a range of teacher talk including different kinds of questions. Providing verbal supports through *cognitive*, *affective,* and *technical* scaffolding during shared story book app interactions is a promising way to support and extend children's early learning.

Cognitive Scaffolding

The teacher in the present case study provided mainly factual and recall questions using sentence starters (e.g., is, what, where). For example, a question like "Is that the pig?" would mostly likely lead to a single word answer such as "yes". The teacher also used predictive questions that could be viewed as having a more open-ended and narrative trajectory to extend the child's thinking about the story content during her interactions with the story book (e.g., "What's going to happen next?). Questions starting with "why" were not observed in the present study, however using questions starters like "why" has the potential to extend children's cognitive processes and thinking and requires more thought than a one-word answer. Use of cognitive scaffolding such as "why" questions during shared reading with a story book app may help develop a child's sense of inquiry.

Deschmukh et al. (2019) suggests that to foster higher levels of verbal language from young children, teachers need to ask more questions in general and increase their use of wh-style questions such as why- and the how- questions. This in turn has the potential for listening to, repeating, and practicing new words to develop oral language skills. Using questioning strategies should follow the child's interests and begin with recall and factual questions, then be extended with why and how questions (e.g., "How do you think the pig is feeling?") that repeats and expands upon the child's responses along with appropriate prompting, feedback, and encouragement.

Affective Scaffolding

The teacher in the present study provided positive feedback and encouragement using words during interactions with digital elements of the story such as "Yes, you can do it!". This approach has the potential to further motivate young children to complete a task or to think about aspects of the story. Affective scaffolding can also maintain a young child's

interest in the story and offer further opportunities and confidence for them to explore and experiment with new words as they engage in two-way conversations. Positively approving and celebrating young children's efforts with metalinguistic words (word, question) such as, "That's a great question"! or "That's a scary word to use to talk about the wolf!", will give children the confidence to delve more deeply into the story and express themselves.

It is also important for educators to carefully reflect upon the types of words used to encourage young children during their participation in activities such as shared story book reading. Kohn (2001) cautions educators about over praising children with repetitive use of phrases (e.g., "Good job") and argues that this type of talk may reduce independence as children may become over reliant on the teacher's evaluations of what they say or do, rather than learning to develop their own judgements. Of course, there is the need to provide a level of praise and affective scaffolding which is "just right". Rather than words of judgement, appropriate teacher evaluation and feedback about what is noticed in the story should be provided (e.g., "The wolf is coming through the dark woods! You helped the pig back into his house so he can be safe from the wolf!").

Technical Scaffolding

The teacher in the present study encouraged Lily's interactions with the characters at just the right time by encouraging her to tap on the text box at the bottom of the digital page and offered explanations (e.g., Lily shouted, "Doggy!" and the Teacher replied, "I think it looks like a doggy but it's the big bad wolf!", "He's going to blow the house down!" "Oh no the pigs!"). The teacher physically modelled hand and finger gestures to provide technical scaffolding such as how to interact with the screen and turn the page by tapping the arrow. Being sensitive and in tune to a child's interactions with a digital tool such as a story book app allows technical scaffolding to occur at the right moment and helps maintain the flow of the story and the child's engagement. The fluid combination of these different kinds of scaffolding are important in understanding the specific characteristics of shared book reading with storybook apps.

A teacher's role is also important in supporting a young child's technical operation of story book app features such as touch gestures that are sometimes difficult and new to young children, such as pinching or stretching or adjusting the volume of the audio. For example, Xu et al., (2020) reported that technical scaffolding is needed for children under four with turning pages in digital books especially those who are less experienced with navigating and using digital books. Sharing quality story book apps which are open-ended in design may provide fruitful opportunities for play, exploration, and immersion in the story. This approach to the shared reading of storybook apps has the potential to foster a creative mind-set for children that is not hindered by fear of failure (Merjovaara et al., 2020).

Limitations and Future Research Directions

The present case study of a spontaneous observation of one teacher and child limits any generalisations of the findings. Further research is needed to analyse teacher-child talk and scaffolding using story book apps in a range of early years settings with children from diverse cultural and family backgrounds. Deeper examination of the types of words and questions that teachers use to support the development of young children's comprehension skills is also needed. The one-on-one teacher-child shared story book interaction that spontaneously occurred over 19 minutes was unexpected due to the usual bustling and demanding nature of an early childhood classroom. Further examination of the feasibility, length of time children are engaged with digital books, and ecological validity of shared story book reading in the busy classroom environment needs further research. Also examining a diverse range of literature about our world such as informational texts cultural stories and the influence of text and pictures is needed to learn more about the benefits of story book apps on learning and their associations with different kinds of teacher-child talk.

It is possible that the number, type, and quality of verbal outputs that occur during shared reading of story book apps could influence early language development (Walsh & Hodge, 2018). However, research is needed to examine this in young children especially the impact of teachers' visual cues in addition to verbal cues on young children's comprehension development. For example, too much teacher talk could hinder children's talk or too little teacher talk could reduce levels of support needed for meaningful and authentic learning and engagement opportunities. It is also important to explore how best to guide teachers in their responses to children who talk about topics unrelated to the story content and how this could influence comprehension and understanding. These 'distractions' may be an opportunity to make connections, for example between the animals in the story (e.g., doggy, rabbit) and the child's personal experiences and knowledge about animals. Further research on how digital books can promote story-based conversations around text to help children focus on understanding key elements of the narrative is important.

There is a pressing need to understand how mobile devices support reading development and a need to advise teachers, parents, and carers with evidence-based strategies for effectively reading digital books to young children (Eutsler, 2019). Supporting teachers through practical professional development workshops will empower them to engage

young children in effective shared reading of story book apps and help them feel confident to engage young children in these important early reading experiences. Teachers need support for their planning and digital resources; and be enabled to provide children opportunities and time to engage in rich teacher-child conversations with story book apps. Valuing and acknowledging a teacher's pedagogical and content knowledge, agency, and expertise is also key (Decat et al., 2019). Finally, early childhood education teachers should be offered the time and space to select quality story book apps, test them out and critically examine storybook apps for their content, interactive and multimodal features, collaborative affordances, social suitability, and age appropriateness (Neumann et al., 2019).

Conclusion

Shared reading of digital books, in which an adult actively scaffolds the young learner, can provide positive opportunities for children to experience the wonder and excitement of language and stories. Using teacher-child talk through interactive use of questions, new words, and repeating words has the potential to engage and maintain the interest of young children. To extend the findings of the present study, a deeper examination is needed to determine how teacher-child talk during shared reading of story book apps can positively engage and scaffold language and literacy learning in the early years setting.

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