

## **Descriptive Observations of Ebook Shared Reading at Preschool**

Kathleen Roskos, Ph.D  
John Carroll University  
[roskos@jcu.edu](mailto:roskos@jcu.edu)

Karen Burstein, Ph.D  
Southwest Institute for Families and Children  
[k.burstein@swifamilies.org](mailto:k.burstein@swifamilies.org)

## **Abstract**

Using a descriptive research design, this study examined the implementation of ebook shared reading in eight preschool classrooms located in two different regions of the United States. Observations focused on teachers' implementation of a vocabulary focused shared book routine, language strategies at the touchscreen, mobile devices to extend the shared reading experience, and children's learning of target words. Participants included a diverse sample of 28 children and 8 teachers. Following a brief training, teachers conducted 8 ebook shared reading sessions (2x per ebook) over a 4-week period at the touchscreen; children browsed or reread stories on a mobile device (iPad or iPod). Video observations, totaling 274 minutes, were analyzed for fidelity of basic shared book implementation, teachers' language modeling and children's use of target words. A pre/post informal curriculum based measure was used to assess target word learning. Results suggest a relatively easy transition from traditional to ebook shared reading that may support children's word learning, but may not maximize the potential of ebooks for instruction and independent reading. Research on instructional techniques and strategies that maximize ebook features and support ebook browsing/reading on mobile devices is needed.

**Key Words:** early literacy, ebooks, shared book reading, digital reading

Publishers of children's books and early reading programs offer an increasing array of ebooks for young children, not to mention a burgeoning 'app' market for iPads, iPods, Nooks and Kindles. In general, the ebook market is escalating with sales increasing 139% in 2010 (Association of American Publishers, 2010) and circulation of ebooks at school libraries reaching a tipping point in relation to traditional books (Library Journal/School Library Journal, 2010). Ebooks, it seems, are everywhere.

From an educational perspective, ebooks have their pluses and minuses – particularly when it involves literacy instruction. On the down side, studies of ebook design show that children's *first* ebooks are mediocre at best, offering low level multimedia, interactivity and literature (deJong & Bus, 2003; Authors, 2009a; Authors, 2009b). On the up side, though, well-designed ebooks with rich visualizations, sounds and music appear to support language, literacy and comprehension, especially for young students at risk (Zucker, Moody & McKenna, 2009). The ebook, in sum, promises a new potential for emerging readers.

For educators the bright promise of ebooks poses some critical pedagogical questions: What role will ebooks play in early literacy instruction? What does effective instruction with ebooks look like? How will they 'fit' into the classroom environment? Presently there are very few (if any) articulated models of early literacy instruction using ebooks, nor is there much research-based guidance on how to use these 21<sup>st</sup> century readers to promote the early literacy knowledge, skills and motivations of young children. Descriptive research can help to lay the groundwork for more controlled studies that examine the instructional effectiveness of ebooks at the onset of the learn-to-read process.

### **Ebook Pedagogy: What We Know So Far**

The transition from print to digital books occurred late in the 20<sup>th</sup> century with ebooks for young children entering the CD-ROM market in the early 1990s. Several lines of

research ensued with the goal of examining the qualities of ebooks and their impact on early literacy experiences. To clarify terms, an ebook is any digital learning object that represents what would generally be considered a traditional children's literature book. These digital learning objects can come in many different shape and sizes, files and formats. They can be designed specifically for use on a mobile device, such as a tablet or cell phone, or may be more broadly accessed via web browser across multiple platforms and devices. The standard purposes of telling a story, explaining a concept, or presenting ideas through a digital text format is at the core of all ebooks. In the move towards digital books, we see a wide array of ebook design that range from static ebooks (pdf; epub), media ebooks (web and mobile apps with audio and/or video) and interactive ebooks (mainly mobile apps). For purposes of this paper, we define ebook as a digital book that includes static ebooks (pdf; audio), media ebooks (web apps) and interactive ebooks (mobile apps).

### **The Ebook as Storybook**

At the heart of early literacy experience is the storybook, which marks the young children's entrée into literacy around the world. Its powerful role in literacy development is well documented in family literacy and early education (e.g., Wasik, Dobbins, & Herrmann, 2001). A staple of the bedtime (or nap) routine, the storybook shared between adult and child mediates what Don Holdaway (1979) decades ago referred to as an emerging literacy set: high expectations of print; models of book language; familiarity with written symbols; print conventions; listening skills; and de-contextualizing abilities (e.g., imaging). Subsequent research supports the claim that storybook reading substantially prepares children for the learn-to-read process, developing their print knowledge, comprehension strategies and vocabulary (Bus, 2001; Senechal, 1997).

Building on this line of inquiry, researchers have examined the ebook as a mediator of emergent literacy skills. Hassett (2006), among others (e.g., Smith, 2001), argues that the combination of sound-print-image used in ebooks yields a new form of representation that makes new demands on emerging readers that go beyond decoding the text. The young reader needs to learn how to negotiate a non-linear, multi-layered reading environment that involves new kinds of search strategies (e.g., click and scroll); new kinds of meaning sources (e.g., graphics and type-set); and new forms of meaning making (e.g., active play with texts). In general, studies show that these signature characteristics of ebooks—visual, sound animation and music effects—do not interfere with emerging literacy skills, and in fact may be promoting skill development for some children, especially those with linguistic delays (Bus, Verhallen, & de Jong, 2009).

But what does adult-child interaction at screen with an ebook look like? In a short term case study with her two-year-old grandson, Labbo (2009) describes how he gradually assumed more responsibility for navigating and telling the story over ten read alouds during a 3-month period. He began to anticipate the story line, comment on screen content, and ‘play out’ the story with his Elmo stuffed animal. The rich description of this case study corroborates related research, which suggests that children benefit from the simultaneous presentation of visual, audio, and print information in making sense of complex messages and story lines (Desmond, Singer, Singer, Calam, & Coalimore, 1985; Verhallen, Bus, & de Jong, 2006).

### **The eBook as Learning Object**

Few studies have directly examined the internal instructional design of the ebook as a literacy learning resource for young children (Authors, 2010a), although studies focused on

literacy development have peripherally observed design problems. Labbo and Kuhn (2000), for example, commented on the need for better designed digital conventions (e.g., pop-ups) to produce more considerate text that supports comprehension. Examining ebooks as educational tools in kindergarten, Shamir and Korat (2009) identified several high level design features relevant to young learners, such as (a) oral reading with text highlights that illuminate the nature of print (e.g., word boundaries); (b) hotspot activation aligned with text; (c) a dictionary option that allows repeated action by the child; and (d) a game mode separate from text mode. More specific testing of ebook design elements reveals that both dictionary hotspots and multiple choice questions strategically placed in the story line benefit word learning; however, vocabulary interruptions in the form of multiple choice questions proved more beneficial than just providing a definition or synonym of the word in a hotspot without a question-format, especially for learning novel words (Smeets & Bus, in press).

### **The Ebook in the Classroom Environment**

Relatively little is known about the impact of ebook-related instructional technology, such as touch screen computers, interactive white boards, and mobile devices, on the arrangement and allocation of classroom space, although it is well-established that physical environments have a profound effect on what young children think, do, feel, and learn (Moore, 2001; Weinstein, 1979). In an electronic age, the goal is to weave ebook browsing and reading into already well-designed physical learning spaces of the classroom, and not to isolate this way of reading from traditional book reading areas, such as the book corner or library center (Lackney, 2003). Several basic principles of classroom design apply, such as ensuring sufficient space for activity in well-lit, low traffic areas that are comfortable and appealing (Moore, 2001; Olds 2001).

When educators begin to blend physical, digital, learner and play spaces together, the overlap opens up new arenas for innovation, referred to as “edges” or “peripheral areas with high growth potential” ([Hagel, Brown & Davison, 2009](#)). We have identified the eBookNook as an edge where the traditional “book corner” and digital media merge to provide teachers and young readers with new literacy learning opportunities with multimedia. Our design research suggests five criteria for supporting ebook reading experiences in an eBookNook (Authors, 2011b): (1) clearly defined locations; (2) clear signage using print and picture; (3) inviting space with appropriate heating, light, color, and graphics; (4) low external sound levels; and (5) several power outlets and adequate Wi-Fi access. In classrooms with well-defined and appealing eBookNooks children appear actively engaged with ebook browsing and reading in shared reading with the teacher at touch screens and on their own or with friends using mobile devices (Authors, 2011c).

### **Description of the Study**

In this study we observe vocabulary instruction in the context of ebook shared reading toward the goal of better understanding ebooks as an instructional resource in early literacy curriculum. Using a descriptive research design, we examined the implementation of ebook shared reading in eight preschool classrooms participating in federal funded Early Reading First programs (2001). To explore the impact of instruction in the ebook setting, the observational focus was on word learning given the significance of vocabulary in learning to read and later reading comprehension (Hart & Risley, 2003). The study was guided by several broad questions:

- (1) To what extent do teachers implement a shared book routine using ebooks at touch screens?

- (2) To what extent do they use language strategies to support word learning with ebook devices?
- (3) To what extent do children engage in word learning with ebook devices?
- (4) Do children benefit from vocabulary instruction in shared reading with ebooks?

## Participants

The sample included 28 children and 8 teachers in preschool classrooms located in the Midwest and Southwest sections of the U.S. (4NE; 4SW). Demographics of the sample are summarized in Table 1. The child sample was diverse including (18% Hispanic; 29% White; 49% African American); included an even mix of boys (n=17) and girls (n=11) and involved children in the average range of the PPVT-IV, with the exception of 9 children with special needs. The teacher sample was also diverse and included four teachers with AA degrees and four with BS or higher degrees; the group averaged 13 years of preschool teaching. All had participated in substantial professional development in evidence-based early literacy instruction as a part of the Early Reading First program (est. 100 hours per year).

Classroom Site	Teacher		Child Sample	
	Education	Years of Experience	Mean Age in Months	Mean PPVT-4
Midwest 1	AA ECE	16	52.43	82.67
Midwest 2	AA ECE	26	49.6	97.25
Midwest 3	AA ECE	10	57.11	110.33
Midwest 4	AA ECE	14	56.43	102.75
Southwest 5	BA-EL	14	54.42	75.33
Southwest 6	M.ED-SPED	25	58.49	84.25
Southwest 7	BAE-SPED	2	52.52	87.25
Southwest 8	BAE-SPED	3	55.49	82

Table 1: Participant Demographics

## Procedures

Prior to the implementation of ebook shared reading sessions, eBookNooks were

created in each of the eight classrooms using design criteria developed in an earlier study (Authors, 2011b). Spatial arrangement of book-nooks was designed to accommodate up to five children, and included a touch screen computer (table top or wall-mounted), comfortable seating, proper acoustics, signage, and appealing graphics. Most book-nook settings were located near the traditional book corner of the classroom. (See Figure 1.)

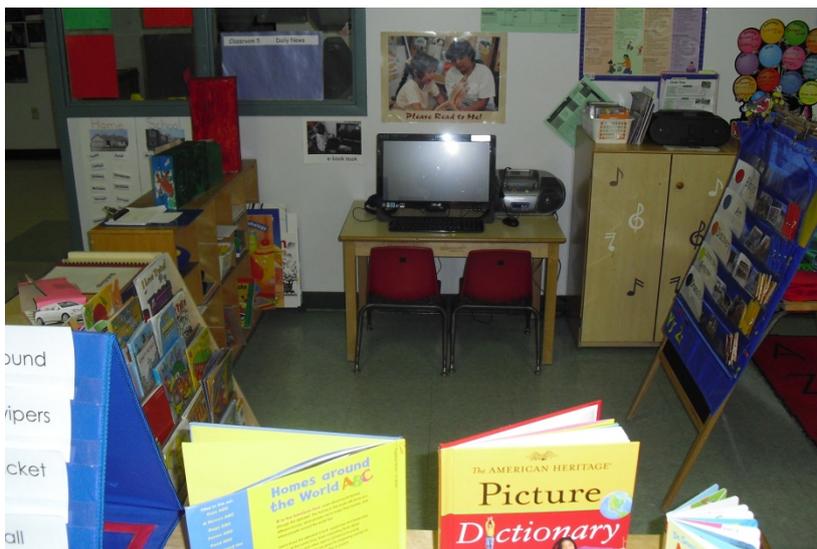


Figure 1: eBookNook Design

Based on research, key features of effective vocabulary instruction were identified (Silverman & Crandall, 2010) and embedded in the before-during-after framework of traditional shared reading (Holdaway, 1979; Mason, Peterman & Kerr, 1989). (See nine step protocol in Appendix A.) Target words, for example, were introduced, defined and repeated throughout the storybook reading session. Children were encouraged to say and discuss new words in context, to use gestures that helped them to remember word meanings and to connect words to their prior experience. Additionally, with the exception of one classroom, children browsed and reread ebooks stories on their own or with a friend using either an iPod or iPad mobile device.

Teachers received training via a web-based tutorial that introduced ebooks, explained operational basics, highlighted design features (e.g., hotspots) and provided an instructional

framework that emphasized vocabulary instruction (est. 90 minutes). During implementation they prepared lessons for ebook shared reading sessions each week and were coached periodically by Early Reading First staff to ensure fidelity to the basic instructional framework. (See lesson planning form in Appendix B.)

Shared ebook reading sessions occurred over a 4-week period during which teachers presented a total of four ebooks, viewing each 2x per week (read 1; read 2) and teaching a total of 40 new words over the time period. (See Appendix C.) After viewing/reading each ebook twice, children in all but one classroom browsed or reread stories on a mobile device, usually toward the end of each week. Thus these children were exposed to each story 3x in a one-week period: twice with the teacher and one time on their own or with a friend.

### **Data Collection**

During the 4-week implementation, video observations were captured from two devices. An external USB webcam/microphone (Blue Microphones Eyeball 2.0 HD Audio and Video Webcam with Microphone) was used to capture video of the children's behaviors. Digital cameras with built-in microphones were used to capture teacher instructional behaviors. Cameras were mounted on tripods and positioned in the rear of the eBook Nook, allowing a detailed capture of instruction and mobile device reading. The teacher or coach would set the Webcam up to record, starting and stopping the recording through software on the touch screen computer; the coach would set-up the rear camera and record from that view. Each shared reading session included a set of video files for each teacher: 2 files from read 1; 2 files from read 2; 1 file from the iPod or iPad browsing/reading (if available). The video capture generated a total of 156 video files. An external hard drive was used to harvest the source video from the Asus Touchscreen PCs and from the digital cameras; files were

transferred to an encrypted storage space for access by the research team for coding purposes.

To gauge children's word learning across the 4-week implementation, their knowledge of the target words was pre/post-tested on each ebook using a curriculum-based decision-making measure (CBDM) that consisted of two assessment tasks: (1) Show Me (receptive vocabulary) which asked children to point to a stated word in a 4-photo panel and (2) Tell Me (expressive vocabulary) which asked children to name a specific photo in a 4-photo display. Both Show Me and Tell Me tasks included 10 words each for a total possible score of 20. Curriculum-Based Decision Making (CBDM) has proved effective for assessing young children's early literacy skills including letter naming and sounds; receptive and expressive vocabulary; alliteration and rhyming (Ergul, Burstein & Bryan in press).

### **Data Analysis**

We used a sampling procedure for analyzing video observational data at 1-minute intervals. A total of 16 ebook shared reading sessions, counterbalanced for first and second viewings each week, constituted the sample, representing 25% of the instruction over the 4-week period. These observational data totaled 274 minutes (147 minutes shared ebook; 127 minutes mobile) and were entered into NVivo 8, a qualitative software program, for analysis based on a coding procedure developed in an earlier study (Authors, 2011c). Early Reading First staff blind to the study reviewed and coded the video observation sample for fidelity of implementation and teacher and child language. Fidelity of implementation was determined based on the extent to which the teachers implemented 8 of the 9-step protocol that represented essential before-during-after instructional interactions. We eliminated step 9 (*prepare for mobile reading*) because this step often occurred on a day/time separate from the shared ebook reading session or was not implemented.

Teacher language was coded in six categories found to support word learning in storybook reading (Wasik, Bond, & Hindman, 2006): directing, explaining, extending, providing feedback, questioning and supporting peer conversation. (See Table 2.) In addition, teachers' weekly lesson plans (at least one plan per teacher with the exception of two teachers) were collected to supplement the video observations. Child language was coded for instances of pronouncing, saying, or using target words during shared ebook sessions and with mobile devices. Target word learning was pre/post-tested for each shared reading session using the CBDM measure.

Language Type	Definition	Example
Directing	Ask/guide children	Say <i>privacy</i> .
Explaining	Clarify by providing more details	<i>A porcupine is an animal covered with sharp quills.</i>
Extending	Elaborate on the explanation/definition	<i>Sometimes we put flowers or books on a shelf.</i>
Feedback	Respond/react to a child's comment	C: 1200 T: Well, 1200 is an even bigger number.
Questioning	Ask/inquire of the children	<i>What do you think the girl means when she says "Monkey see, monkey do?"</i>
Conversing	Encourage children to talk to one another	<i>Tell your friend Jerel about the picture.</i>

Table 2: Teacher Language Categories

## Results

### Teachers' Implementation of a Shared Book Routine

With the exception of viewing/listening with the children rather than reading a 'book' to them, ebook shared reading affords an instructional setting similar to traditional storybook reading. It should include, therefore, strategies that engage children before, during, and after reading, and that support learning essential literacy skills. In this study, teachers were guided

to implement shared reading using a basic before-during-after routine and to teach target vocabulary words in the story context. The extent to which they implemented essential instructional steps over the 4-week period in the ebook setting is summarized in Figure 2.

Early Reading First staff rated a sample of video observation for fidelity to each of the eight steps in the protocol by assigning either a 1 for implementation or a 0 for lack of implementation.

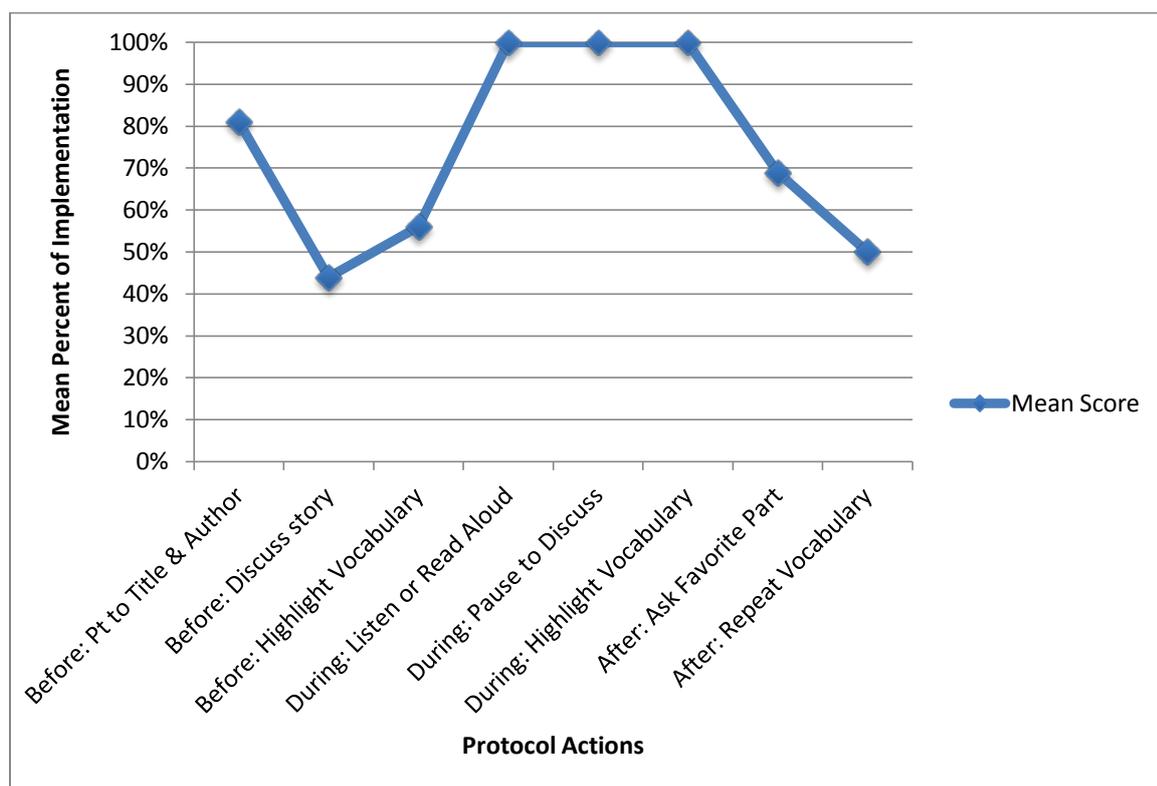


Figure 2: Mean Fidelity to Shared Book Routine

In brief these data show overall fidelity at 75% of the routine, indicating that the teachers adhered to a basic instructional framework fairly consistently across the implementation period. Fidelity was highly consistent during the ebook reading (100%) and less consistent before and after reading (about 60% of the time). The less frequent attention to vocabulary before (about half the time) and after reading (again, half the time) is notable because it

impacts amount of exposure to target words.

### Teachers' Language Use to Support Word Learning

A solid body of research shows that adult-interruptions while reading to highlight and discuss vocabulary words that children may not know increases their chances of learning and remembering new words (Biemiller & Boote, 2006; Justice & Ezell, 2002; Silverman, 2007). Several language facilitation strategies have been found to be especially effective, such as explaining what words mean in the story context (Coyne, McCoach, Loftus, Zipoli, & Knapp, 2009; DeTemple & Snow, 2003). The mean frequency of teachers' language strategies to support word learning across stories and devices is displayed in Figure 3.

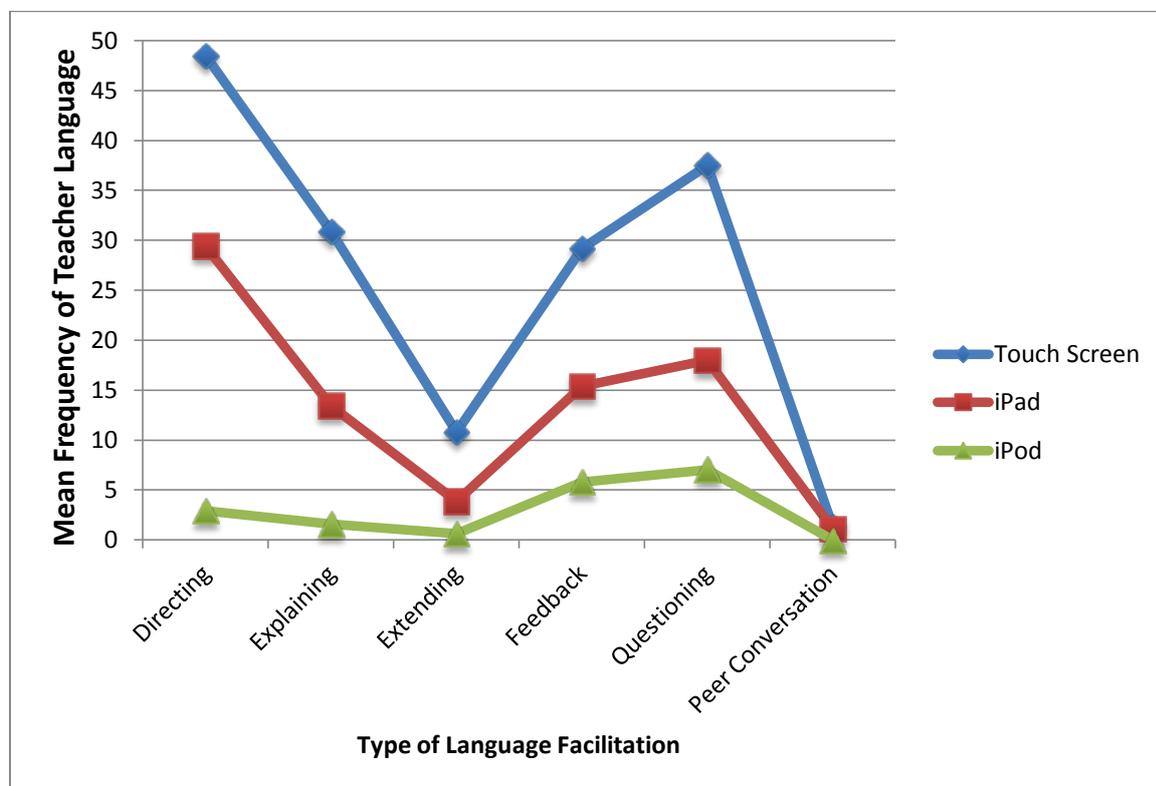


Figure 3: Mean Frequency of Teacher Language Use by Type and Device Over All Sessions  
Most of the teachers' language facilitation occurred at the touchscreen followed by the iPad and the least with the iPod. Directing the children's attention to new words was the most

used strategy with the exception of the iPod setting where asking children questions about what they were viewing and providing feedback appeared to work in tandem. At the touchscreen, teachers tended to direct attention to words, ask questions, explain, and provide feedback about new words offering few extensions and allowing very little conversation among children. This pattern resembles that frequently observed in traditional storybook reading where teachers, more or less, point out new words, ask children questions about words, provide definitions, and offer feedback on pronunciation and word meaning (Silverman & Crandall, 2010).

Language facilitation with iPads generally follows a similar pattern, which suggests that this mobile device appears to afford instructional talk more so than the iPod where instructional talk appears to drop rather dramatically. Across all settings, teachers' use of an extending strategy was quite low, thus they did not elaborate very much on word meanings nor did they encourage children to engage in peer conversations about words. Given the children's age (4 year-olds) and the time limitations for read aloud sessions in classrooms, the lack of peer conversation is perhaps to be expected. The limited use of teachers' use of the extending strategy in ebook shared reading, especially at the touchscreen, however, is problematic given its importance in strengthening children's understandings of novel word meanings (Senechal, Thomas & Monker, 1995).

### **Children's Use of Target Words**

A critical feature of storybook reading is the opportunity for children to say and use words that may be new to them. Shared reading of big books, little books and ebooks should create conditions for children to rehearse and use new words (Penno, Wilkinson, & Moore, 2002; Senechal, 1997). Evidence of children's use (i.e., pronouncing, repeating, defining) of target words across sessions by device is shown in Figure 4.

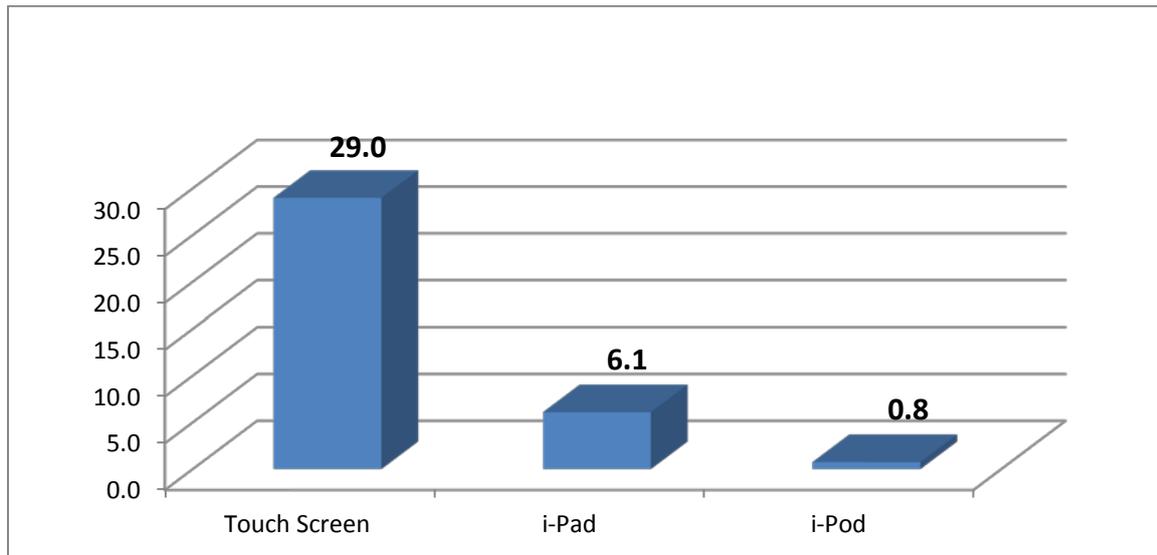


Figure 4: Average Frequency of Target Words Spoken by Children Across Sessions By Device

The bar graph shows that children (in aggregate) orally pronounced the target words about 30 times on average when at the touch screen as compared to six times when using the iPad and rarely, if at all, with the iPod. This is to be expected given the shared reading routine used by the teacher at the touchscreen which prompted children to say and define target words. Granted, too, these data present a gross view of word use, since some children may have spoken a lot and others very little, if at all. That the children did not utter the target words very often, however, does not necessarily mean they were not processing them. Some recent research, for example, suggests that oral pronunciation may not be critical to word learning from interactive digital books (Smeets & Bus, in press). Even though the children, here, were not orally saying the target words they may have been mentally rehearsing them, especially when using the mobile devices.

Figure 5 provides another cut on children's word usage, showing the variations by classroom location (SW classrooms 1-4; MW classrooms 5-8). (Note: SW classroom 2 did not implement use of the iPad or iPod.) In general, children in the Southwest classrooms

tended to use target words more frequently than those in the Midwest classrooms. Those children in classroom 4 (SW) verbalized the target words the most while those in classroom 6 (MW) did so the least. We see a similar pattern in children's word usage with mobile devices; children tended to verbalize target words when using iPads or iPods more often in the Southwest classrooms (1, 3, 4) and less so in Midwest classrooms (5-8). In two of the Midwest classrooms (5, 6) children did not say the target words at all.

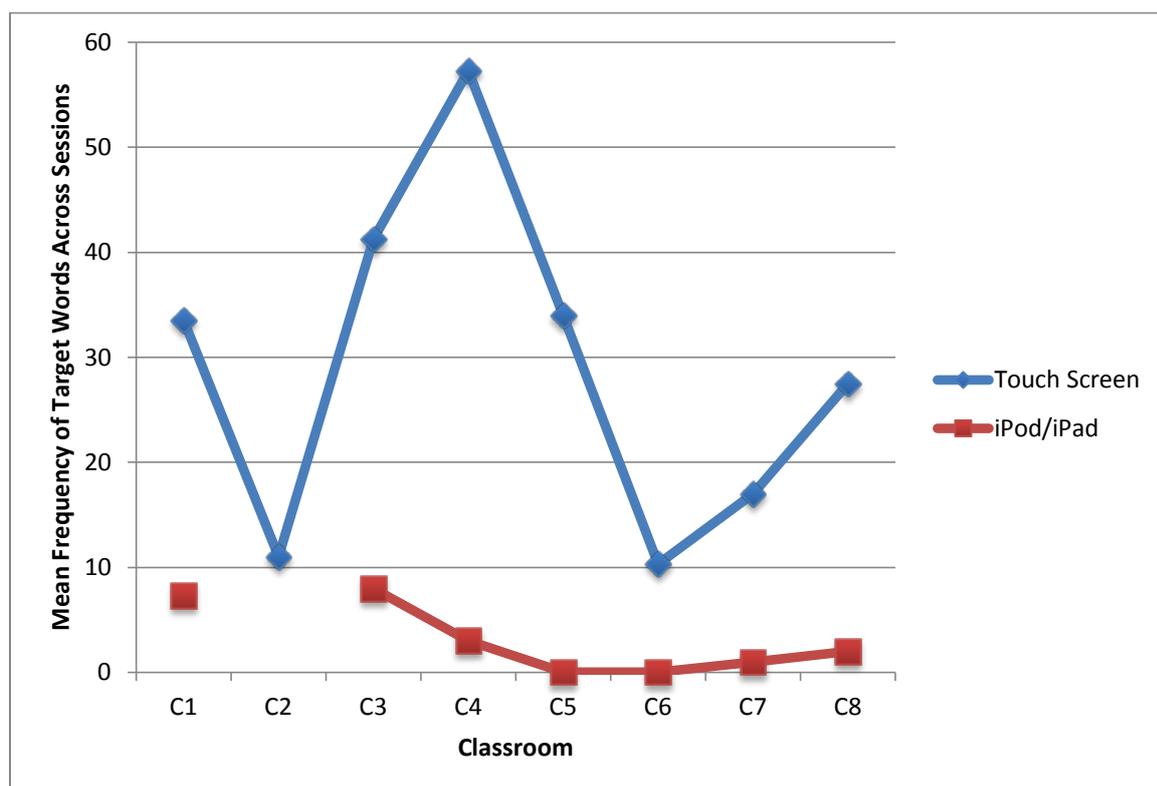


Figure 5: Average Frequency of Target Words by Children by Classroom and Device

In brief, these descriptive data suggest the potential influences of device and teacher variables on children's opportunities to learn new words from ebooks. The touchscreen setting, for example, was more structured in that it was teacher-led, involved groups and followed a basic shared book routine whereas the mobile settings were less structured, allowing children to browse and read on their own with minimal teacher facilitation. Of the

two mobile settings, the iPad seemed to elicit more oral pronunciation of words than the iPod. To be expected, individual teacher variation also influenced children's use of target words with some teachers creating more opportunities within the instructional routine for children to verbalize target words than others. That this a necessary condition for learning new words, however, is open to question. Children may learn new words without necessarily pronouncing them (Smeets & Bus, in press).

### Children's Learning of Target Words

A critical goal of a shared reading approach is the development of early literacy skills that lay the foundation for learning to read. In this study we explored the potential of ebook shared reading for influencing children's learning of target words in stories that might contribute to their vocabulary store. Our preliminary results are positive suggesting that the children did learn new words over the short term. (See Figure 6.)

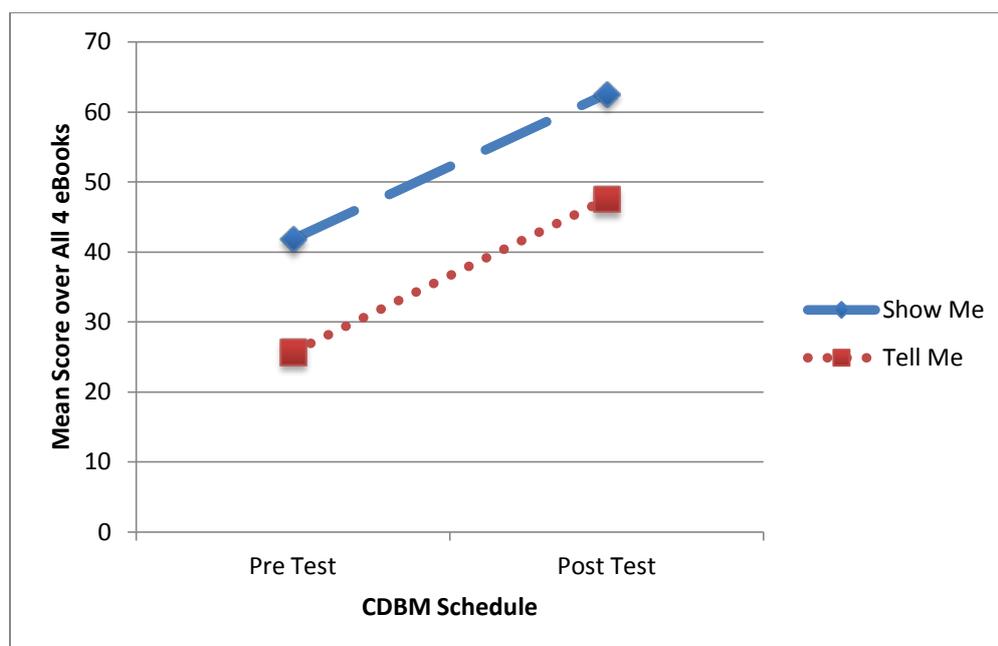


Figure 6: Pre and Post Test CDBM Results Across All Four eBooks

Children were exposed to a total of 40 target words over the 4-week period.

Aggregating mean scores from pre-post-tests on each book (10 words each), the children knew 34% of the target words (about 7 words) prior to shared ebook reading and 55% (about 11 words) following the set of sessions which shows a gain of 21 percentage points (about 4 words). This translates to about one new word per week added to the children's vocabulary.

There were no substantive differences in pre-post-test results by type of vocabulary knowledge (receptive; expressive), although children started out with proportionally fewer target words in their expressive (26%) than their receptive vocabulary (42%). Children made comparable gains of about 2 new words over the four weeks in each mode. This is notable, since children tend to gain fewer words expressively than receptively in shared storybook reading (Senechal, 1997).

## **Discussion**

This study explores the ebook as an instructional resource for shared reading in a small sample of Early Reading First preschool classrooms. Following an orientation and training on operating, noting design features and using ebooks for instructional purposes, teachers implemented a vocabulary-focused shared book routine using ebooks at touchscreens with small groups of children in eBookNook settings. Results showed adequate fidelity to vocabulary instruction in a basic before-during-after routine; language modeling consistent with traditional shared book reading; device and teacher variability; and evidence of children's word learning.

From these results several descriptive observations emerge that inform ebook pedagogy. First, it appears that the transition from traditional to digital shared reading is not too difficult, as teachers readily implemented a familiar BDA routine with ebooks at the touchscreen. As they viewed/listened to ebook stories with children, they implemented key instructional steps with fidelity a majority of the time, thus creating learning opportunities not

too different from those in traditional shared book reading (e.g., Big Books). In this instance, the known of *shared book* practice appeared to support and structure shared reading in the relatively unknown reading environment at screen.

The data also suggest, however, that this transfer may be a ‘package deal’ in that it includes not only fidelity to extant practice (for the most part), but also habits of language modeling that may more or less support word learning from books. These teachers, for example, preferred strategies of directing, asking questions, and explaining new words over extending word meanings or engaging children in conversations about words--strategies they likely know and use with traditional books. They did not, however, adapt their instruction to capitalize on the unique media qualities of ebooks (e.g., music; illustrations; animations; hotspots) found to improve conditions for word learning, such as linking sensory information to word meaning, talking over animations to explain them, exploring the content of a hotspot, or interrupting to explore, categorize and/or connect words to children’s experience (Shamir & Korat, 2009; Smeets & Bus, in press}. Thus while the structural similarity between traditional and ebook shared reading may present a pedagogic advantage, it also may create a blind spot to the unique features of ebooks that might enhance word learning. Moreover, it may facilitate transfer of ineffective practices to a new (and potentially rich) learning environment with ebooks.

Second, the results highlight differences between ebook reading at the touchscreen and with mobile devices relevant to an ebook pedagogy. In brief, structures and strategies around child-led ebook browsing and reading with mobile devices appear less developed than those at the touchscreen. While implementing a shared book routine at the touchscreen setting (teacher-led, small group interaction) functioned rather smoothly for these teachers, how to facilitate children’s engagement with ebooks on mobile devices (child-led, individual/pairs

interactions) appeared more problematic as suggested by the low levels of teacher language in these settings. Perhaps seen as a time for independent book browsing and reading (a common 'on the rug' practice in many early childhood classrooms), opportunities to encourage, prompt, extend, and converse about the ebook content and words were overlooked. Left to their own devices, children will explore and learn from ebooks, but they also can quickly lose their sense of purpose, lapsing into frivolous, aimless activity. Teachers may need more guidance here about how to maximize ebook browsing/reading with mobile devices in ways that support instructional goals. Further research is needed to generate, develop and test vocabulary instructional techniques specific to ebook design. Techniques, for example, that connect vocabulary highlighted in ebook shared reading to independent ebook browsing are needed; also how to use media elements, such as music, animation, hotspots and graphics to full advantage when teaching new words would be helpful.

Third, the results point to the promise of ebooks for supporting word learning in the preschool classroom. Even with brief exposure to a set of target words, children made gains in both their receptive and expressive vocabularies. The ebook, therefore, may extend the opportunities for word learning in the early literacy curriculum. Along with traditional shared book reading and read aloud activities, teachers can use ebooks to further expose children to vocabulary words.

### **Limitations**

There are several limitations to this study that need to be taken into account when interpreting the results. First, it was conducted in Early Reading First classrooms, which adhere to a scientifically based early literacy curriculum focused on essential skills and this orientation may have influenced the shape and direction of the ebook shared reading experience. Less prescribed curricular approaches to digital reading likely have different

effects on children's experience, emphasizing different reading behaviors and skills that contribute to vocabulary growth (e.g., listening comprehension). Additionally the study relied on convenience samples of small sizes within a few select Early Reading First classrooms, further compromising the generalizability of the results. Formative studies involving a broad range of Early Reading First program classrooms with larger samples would provide richer descriptive information as the foundation for hypothesis-generation and testing. Also, teachers did not implement the protocol to a high degree (<80%), which may have had a bearing on the opportunities for word learning in the electronic environment. Further teacher development and training appear necessary to maximize the potential of ebooks for shared reading, especially for children with vocabulary delays. The completeness of video capture was also an issue and relevant video data may have been lost at the outset and not included in subsequent analyses (e.g., language use), thus impacting the results. Future studies should strive to widen the settings and samples, emphasize instructional techniques unique to ebooks and improve video-observational techniques to capture rich descriptions of ebook shared reading in the preschool classroom.

## **Conclusion**

Over time, each emerging and new technology/curricular resource is accompanied by a pedagogy, or set of practices, that attempts to maximize its instructional use with learners. The medieval-age hornbook called for instructional techniques and strategies that emphasized pronouncing letters and sounds correctly and articulately. Teaching, therefore, focused on recitation. The basal reader system led to a host of oral and silent reading teaching techniques collapsed into the directed reading lesson, which consisted of multiple steps (and workbooks for practice). The Big Book introduced the idea of collaborative or shared reading, neatly summed in the Read To, Read With, You Try procedure; it also emphasized after reading

activities sans workbook and connecting texts and reading experiences to one another, as well as to children's lives. Today we face a new challenge: teaching early reading skills effectively in the electronic reading environment using digital devices. As it goes, ebook pedagogy will likely be a hybrid of old and new reading instruction practices. Our study highlights structural similarities between traditional and ebook shared reading and explores the potential of ebooks for supporting children's word learning from books. It is grounded in what teachers know and do, and opens the door for examining what they may need to learn to realize the potential of ebooks in the early literacy curriculum.

## References

- Association of American Publishers (2010). Bookstats publishing formats highlights. retrieved from <http://publishers.org/bookstats/formats/>
- Authors. (2009a).
- Authors. (2009b).
- Authors. (2011a).
- Authors. (2011b).
- Authors. (2011c).
- Biemiller, A. & Boote, C. (2006). An effective method for building meaning vocabulary in primary grades. *Journal of Educational Psychology*, 98, (1), 44-62.
- Bus, A. G. (2001). Joint caregiver-child storybook reading: a route to literacy development. In S. B. Neuman & D. K. Dickinson (Eds.), *Handbook of early literacy research, VI* (pp. 179-191). New York: Guilford Press.
- Bus, A. G., Verhallen, M., & de Jong, M. T. (2009). How onscreen storybooks contribute to early literacy. In A. G. Bus & S. B. Neuman (Eds.), *Multimedia and Literacy Development: Improving Achievement for Young Learners* (pp. 153-167). New York: Routledge.
- Coyne, M. D., McCoach, D., Loftus, S., Zipoli, R., Jr., & Kapp, S. (2009). Direct vocabulary instruction in kindergarten: Teaching for breadth versus depth. *The Elementary School Journal*, 119(1), 1-18.
- de Jong, M. T., & Bus, A. G. (2003). How well suited are electronic books for supporting literacy? *Journal of Early Childhood Literacy*, 3, (2), 147-164.
- Desmond, R., Singer, J., Singer, G., Calam, R., & Colimore, K. (1985). Family mediation patterns and television viewing: Young children's use and grasp of the medium. *Human Communication Research*, 11(4), 461-480.
- De Temple, J., & Snow, C. E. (2003). Learning words from books. In A. van Kleeck, S. A. Stahl, & E. B. Bauer (Eds.), *On reading books to children: Teachers and parents* (pp. 16 -36). Mahwah, NJ: Erlbaum.
- Early Reading First. <http://www2.ed.gov/programs/earlyreading/index.html>
- Ergul, C., Burstein, K., & Bryan, T. (in press) Curriculum based decision making: An assessment model to enhance early literacy skills of ELL preschoolers with and without special needs.

Hart, B., & Risley, T. R. (2003). The early catastrophe: The 30 million word gap by age 3. *American Educator*, 27(1), 4-9.

Hagel, J., Brown, J. S., & Davidson, L. (2009). How to bring the core to the edge. HBR Blog Network. Retrieved from: <http://blogs.hbr.org/bigshift/2009/02/how-to-bring-the-edge-to-the-c.html>

Hassett, D. (2006). Signs of the times: The governance of alphabetic print over 'appropriate' and 'natural' reading development. *Journal of Early Childhood Literacy*, 6(10), 77-103.

Holdaway, D. (1979). *The foundations of literacy*. Portsmouth, NH: Heinemann.

Justice, L. M., & Ezell, H. K. (2002). Use of storybook reading to increase print awareness in at-risk children. *American Journal of Speech-Language Pathology*, 11, 17-29.

Lackney, A. (2003). *33 principles of educational design*. School Design Research Studio. Retrieved from <http://schoolstudio.engr.wisc.edu/33principles.html>

Labbo, L. (2009). Let's do the computer story again, Nana: A case study of how a two-year-old and his grandmother shared thinking spaces during Multiple Shared Readings of an Electronic Story. In A. G. Bus & S. B. Neuman (Eds.), *Multimedia and Literacy Development: Improving Achievement for Young Learners* (pp 196-210). New York: Routledge.

Labbo, L., & Kuhn, M. (2000). Weaving chains of affect and cognition: A young child's understanding of CD-ROM talking books. *Journal of Literacy Research*, 32(2), 187-210.

Lackney, A. (2003). *33 principles of educational design*. School Design Research Studio. Retrieved from <http://schoolstudio.engr.wisc.edu/33principles.html> Moore (2001).

Library Journal/School Library Journal (2010, November). *Survey of ebook penetration and use in U.S. school (K-12) libraries*. Retrieved 12.01.11 from [www.libraryjournal.com](http://www.libraryjournal.com)

Mason, J. M., Peterman, C. L., & Kerr, B. M. (1989). Reading to kindergarten children. In Dorothy S. Strickland & Lesley Mandel Morrow (Eds.), *Emerging literacy: Young children learn to read and write* (p.52-62). Newark, DE: International Reading Association.

Moore, G. T. (2001). Children, young people and their environment. Keynote address at the Fourth Child and Family Policy Conference, Dunedin, NZ.

Olds, A. R. (2001). *Child Care Design Guide*. New York: McGraw-Hill Professional.

- Penno, J. F., Wilkinson, I. A. G., & Moore, D. W. (2002). Vocabulary acquisition from teacher explanation and repeated listening to stories: Do they overcome the Matthew effect? *Journal of Educational Psychology, 94*(1), 23-33.
- Senechal, M. (1997). The differential effect of storybook reading on preschoolers' acquisition of expressive and receptive vocabulary. *Journal of Child Language, 24*(1), 123-138.
- Senechal, M., Thomas, E., & Monker, J. (1995). Individual differences in 4-year-old children's acquisition of vocabulary during storybook reading. *Journal of Educational Psychology, 87*, 218-229.
- Shamir, A., & Korat, O. (2009). The educational electronic book as a tool for supporting children's emergent literacy. In A. Bus & S. B. Neuman (Eds.), *Multimedia and literacy development* (pp. 168-181). New York: Routledge.
- Silverman, R. (2007). A comparison of three methods of vocabulary instruction during read-alouds in kindergarten. *The Elementary School Journal, 108*, ( 2), 97-113.
- Silverman, R., & Crandall, J. D. (2010). Vocabulary practices in prekindergarten and kindergarten classrooms. *Reading Research Quarterly, 45*, 318-334.
- Silverman, R., & Hines, S. (2009). The effects of multimedia-enhanced instruction on the vocabulary of English-language learners and non-English-language learners in pre-kindergarten through second grade. *Journal of Educational Psychology, 101*, 305-314. doi: 10.1037/a0014217.
- Smeets, D., & Bus, A. (in press). Interactive electronic storybooks for kindergarteners to promote vocabulary growth. *Journal of Experimental Psychology*.
- Smith, C.R. (2001). Click and turn the page: an exploration of multiple storybook literacy. *Reading Research Quarterly, 36*, 152-183.
- Verhallen, M., Bus, A., & de Jong, M. (2006). The promise of multimedia stories for kindergarten children at risk. *Journal of Educational Psychology, 98*, 410-419.
- Wasik, B. H., Dobbins, D. R., & Herrmann, S. (2001). Intergenerational family literacy: Concepts, research, and practice. In S. B. Neuman & D. Dickinson (Eds.), *Handbook of early literacy development* (pp.444-458). New York: Guilford Press.
- Wasik, B. H., Bond, M. A., & Hindman, A. (2006). The effects of language and literacy intervention on Head Start children and teachers. *Journal of Educational Psychology, 98*(1), 63-74.
- Weinstein, C. S. (1979). The physical environment of the school: A review of the research. *Review of Education Research, 49*(4), 577-610.

Zucker, T., Moody, A., & McKenna, M. (2009). The Effects of Electronic Books on PreKindergarten-to-Grade 5 Students' Literacy and Language Outcomes: A Research Synthesis. *Journal of Educational Computing Research*, 40, 47-87.

### Appendix A

Segment	Steps	Check <i>if present</i>
Before Reading	Point out title and author	
	Discuss what story is about	
	Introduce vocabulary words (Say, Tell, Do)	
During Reading	Listen or Read Aloud	
	Pause to discuss	
	Highlight new words (Say and/or Tell and/or Do)	
After Reading	Ask for favorite part	
	Repeat new words (as needed)	
	Prepare for mobile reading	

### Appendix B

Shared eBook Reading Plan		
Title:		Date:
New Words:		
Instructional Segment	Plan	Notes
		<i>Note pre-selected screens for instruction; information/vocabulary to point out; organization for mobile reading</i>
Before <i>Use pocket chart for introducing target words</i>	<ul style="list-style-type: none"> <li>• Point out title, author</li> <li>• Discuss what the story is about</li> <li>• Highlight vocabulary words (Say; Tell; Do)</li> </ul>	
During	<ul style="list-style-type: none"> <li>• Listen or Read Aloud</li> <li>• Pause to discuss</li> <li>• Highlight new words (as needed)</li> </ul>	
After	<ul style="list-style-type: none"> <li>• Ask for favorite part</li> <li>• Repeat new words (as needed)</li> <li>• Prepare for mobile reading</li> </ul>	
Mobile	<ul style="list-style-type: none"> <li>• Distribute mobile devices to individuals or pairs</li> <li>• Select place to browse/read</li> <li>• Monitor engagement</li> </ul>	
Observations		
Note: Keep vocabulary instruction short and simple. (1) Say target words and ask children to say them. (2) Tell about the word meaning and encourage children to talk about the meaning a little bit. (3) Use a gesture (if possible) to help children remember the word; invite children to use the gesture + say the word.		

### Appendix C

Week 1		
eBook Title	Me Too!	
	Vocabulary Word	Definition
	envy	Wishing you had what belongs to another person
	aquatics	All about things you do in water
	coach	Person who teaches
	privacy	Wanting to be alone, not bothered
	wonderful	To like something or someone
	play date	Planning a time and place to play with another child
	binkies	A name for a baby's pacifier/Nuk. Something a baby sucks on to stay quiet.
	copies	To do exactly as someone else
	lock	A tool used to keep people or things in or out/ cannot open an object
	giggling	When people are laughing quickly in a high voice

Week 2		
eBook Title	Porcupining	
	Vocabulary Word	Definition
	bucky	When your front teeth stick out.
	console	To makes someone feel better when they are sad.
	habitat	A place where an animal lives.
	hutch	A large box made of wood and wire for a small pet to live in.
	lodge	A home that a beaver lives in.
	lonesome	Sad and all by yourself.
	porcupine	An animal that is covered with lots of sharp spines called quills growing all over its back and sides.
	quills	Long, sharp spines that are on a porcupine's body.
	sow	A girl pig.
	wife	When a girl marries a boy she is the wife.

Week 3		
eBook Title	Hoover's Bride	
	Vocabulary Word	Definition
	repairs	To fix something that is broken or damaged
	sprouted	Starting to grow
	collapse	To fall down suddenly
	stagger	To walk or move unsteadily, almost falling
	reception	A large party to celebrate

	flatter	To praise someone to make them happy, but what you say is not true
	appliance	A piece of equipment used in people's homes
	machine	A piece of equipment with moving parts that uses power such as electricity to work
	level	To make something flat that has not been flat
	fled	Run away

Week 4		
eBook Title	Something Good	
	Vocabulary Word	Definition
	snuck	To go somewhere secretly or quietly so that you are not seen or heard
	rot	To become bad
	hundred	A very large number of things
	price tag	A piece of paper with how much something costs on an item in a store
	cart	A large wire or plastic basket on wheels you use in a store
	aisle	A long path between rows of shelves in a store or building
	trouble	To cause a person problems
	knocked	To hit something
	cash register	A machine used in stores to keep money in and count money from sales
	shelf	Long, flat boards or metal rectangles on a wall or in a cabinet used for holding objects