E-Book Reading on Children

Subjects: Environmental Studies
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Children are growing up in a digital media environment where interactions with digital media are an increasing part of children's daily lives in classrooms and at home. More children, across all levels of society, are using interactive and mobile media on a daily basis.

Keywords: reading ; e-book ; childhood ; literacy ; preschool ; first grade ; phonological awareness ; vocabulary

1. Introduction

Children are growing up in a digital media environment where interactions with digital media are an increasing part of children's daily lives in classrooms and at home. More children, across all levels of society, are using interactive and mobile media on a daily basis [1]. In a recent survey of parents of children aged 8 years and under, the majority (98%) reported that they live in a home with some type of mobile device [2]. As a result of this exposure to technology, children today have many opportunities to explore digital devices and play with them. Many activities in children's lives are digital, including early literacy experiences. Children's books are increasingly available in a digital format on electronic devices—often handheld and mobile [3].

E-books present interactive multimodal information as written text, oral reading, music, illustrations, animations, and hotspots that are activated by touching or pressing the touch screen to generate sound and animation (see an example of the e-book "A Shiver of Sharks": http://bit.ly/2nM3Gr8) (accessed on 15 April 2021) [4]. With digitization, new opportunities for the mediation of multimodal text have emerged. Among the potential advantages of e-books is that they are easily accessible and interactive for beginning readers who cannot yet decode text or are just beginning to learn to decode. Even children with emergent literacy skills who cannot yet read can explore e-books by themselves without the help of an adult [5]. This invites reading practices that may differ from traditional book reading, due to the affordances of the digital touch screen and the social settings in which it is used [6].

However, questions regarding young children engaging with e-books arise regarding whether these digital stories are as beneficial for children as print books read by an adult. There has been much hope for the educational potential of interactive media, such as e-books, along with fear about their overuse during early childhood, a period of rapid brain development. We are only beginning to understand what this digital shift means for young children's early literacy development [3]. The following questions are still unresolved: What do e-books bring to a child's early literacy experience? Additionally, what are the digital reading potentials for improving and enriching the literacy environment of a young child?

2. Effects of Digital Reading on Children's Literacy Skills

In the last decade, five reviews [7][8][9][10][11] and four meta-analyses [12][13][14][15] have been carried out to compare children's reading acquisition ability when using digital devices versus the use of traditional printed books [7][8][9][10][11][12][13][14].

Two of these reviews [8][9] concluded that e-books and printed books play different roles in learning to read and, therefore, the false dichotomy between these two forms of reading should be eliminated, because they are different experiences of reading. A review investigating the role of digital reading [9] found that tablets may improve emergent literacy skills. However, parent or teacher scaffolding is needed to maximize the benefits of e-books. A different review [10] reported that well-designed e-books are as effective as printed books in improving reading acquisition outcomes. A meta-analysis on multimedia stories, which compared independent e-book reading with traditional shared book reading, found that multimedia features can provide similar scaffolding to reading with an adult [12]. A different meta-analysis [13] found that stories presented through multimedia can support and even strengthen children's understanding of the story compared to listening to stories in more traditional settings, such as storybook reading. Similarly, a research synthesis of experimental and quasi-experimental studies investigating the effects of e-books on children's literacy development found moderate

effects of e-books on reading comprehension [14]. However, a recently published meta-analysis examining the effects of e-book use on literacy outcomes found no statistically significant effects between e-book and non-e-book conditions on norm-referenced standardized test measures of reading and reading comprehension [15].

Despite the positive outcomes of e-book reading, a number of researchers have taken a more critical view on e-books due to their incorporation of features such as hotspots that contain animation, sound, and other multimedia effects and may distract young readers from the story content and negatively affect their understandings of the story's main theme [10][11][13][14]. Some hotspots are congruent with the story (i.e., support the story's content) and others are incongruent (i.e., they do not align with the story content and might even distract the reader from it) [4]. In this sense, a recent analysis on e-book design reveals that the first published digital books included hotspots that often had little or no relevance to the story and distracted children from language and literacy learning. Nevertheless, important improvements have been made in e-book design compared to former years as the number of interactive visuals and of hotspots seem much lower than in previous years, and they are more congruent; that is, they elaborate or extend the story line, as it is advisable [16].

Another finding of the literature on e-book reading is that adult–child interaction and e-book sharing with young children differs from sharing print books [8][10][11]. Parents reported their children not only read traditional books more than electronic books, but enjoyed them more and paid more attention to them. Caregivers also reported participating in more talk about the story when reading print books than electronic books [17]. Similarly, teachers sharing an enhanced digital book struggle to define their role [6]. When sharing a digital book, children may be occupied by the interactive elements in the book (tapping hotspots initiates sounds, simple animations, and dialogue/sounds from the characters) while ignoring the story. More research is needed to further explore new routines that develop when families or educators have access to a set of well-designed digital picture books.

Despite these concerns, previous empirical studies have identified the effects that e-books can have on the development of children's literacy skills. Due to their many unique features, e-books provide children with many opportunities for promoting their emergent literacy skills. For instance, studies have shown that digital books support the development of children's print and phonological awareness [18][19][20], vocabulary development [18][21][22], spelling development [23], and reading comprehension [5][24]. These skills (e.g., phonological awareness, print awareness, vocabulary, and reading comprehension) are considered significant to the development of children's emergent literacy abilities.

3. Health and Developmental Concerns

Heavy media use during preschool years is associated with negative effects on children's health, general development, and outdoor play [1]. The risks of children spending a lot of time in front of a screen have been well documented by research: Addiction [25], obesity [26], negative effects on motor dexterity [27], and eye fatigue [28], among others.

Moreover, since the cognitive control mechanisms are still immature in young children [29] the high exposure to digital games (also found in e-books) makes them especially vulnerable to develop pathological gaming behavior [30]. Pathological gaming has become a major concern for health care professionals during the last years [31] and has been included as a game disorder in the International Classification of Disease (ICD-11) Manual [32], as well as, a condition called Internet Gaming disorder in the Diagnostic and Statistical Manual of Mental Disorders 5 (DSM-5) [33]. Thus, evidence is sufficient to recommend time limitations on digital media use for children 2 to 5 years to no more than 1 h per day [34].

It is reasonable for parents and teachers to be concerned about the excessive use of digital content, especially in young children. However, touch screen devices are rapidly gaining place in the lives of families with young children, and parents also hold positive views toward technology use and are able to identify a range of benefits that their children have acquired [1][2]. Today, media represent just another environment; children do the same things they have always done, only virtually.

A different issue related to health that has changed education dramatically and globally, with the distinctive rise of e-learning, has been the COVID-19 pandemic.

Considering these two scenarios, young children growing up in contexts saturated with technology and the shift away from the classroom and the adoption of online and digital learning in many parts of the world, policies and recommendations must evolve and provide thoughtful, practical advice to parents and teachers founded on evidence, and not based merely on the precautionary principle [35].

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