ENCYCLOPEDIA on Early Childhood Development

Electronic(E)-books as a Support for Young Children's Language and Early Literacy

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Introduction

Use of technology has become common and natural in our lives, including among children. Increasingly, young children are exposed not only to printed books, but also to e-books, which they read independently or together with adults. Market share for e-book sales is rising steadily. This is true even for products targeting preschool aged children in different languages.[1] Reading e-books which incorporate multimedia, such as animation, music, sound effects, illuminated text, and text read out loud by a narrator, provides synergy where there is a joint and integrated operation of two or more factors that might affect the reader.[2] The combined operation of these actions is perceived as more effective than the employment of each factor separately. According to this theory, young children, especially children at risk for language learning, may benefit more by studying in a way which incorporates the use of several types of media than by using only a single medium.[3,4]

Subject

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Reading books to young children is one of the most important activities for developing language and early literacy skills.[5,6] Popular e-books go beyond written text and illustrations: they also integrate multimedia features. Hidden ‘hotspots’ on the screen can be touched by the user to animate or elaborate illustrations and text in a fashion that supports language development and story comprehension. Illuminated text, which is highlighted congruently with the narrator’s reading, may help the child track the written text, thus promoting print awareness. These features are engaging and motivating and may comprise a support for young children's language and early literacy learning. These e-book features also make it possible for children to "read" (or listen to the books) independently without adult support. Therefore, the abundance of e-books available on the market today present new possibilities for learning but also new challenges for shared reading between adults and children.

Problems

Although many hopes have been raised with reference to the potential of e-book reading by young children, their quality as language and early literacy support is controversial. There is a concern that many e-books found on the commercial market are targeted more towards amusement, and emphasize multimedia, colours, sounds, and graphics, but that they are not necessarily suitable for promoting young children’s learning.

Research Context

Reviews of e-book research vary in focus. Some researchers have examined the structure and components of e-books available on the market in relation to ideal parameters.[7,8,9] Others have reviewed the evidence regarding the effectiveness of e-books on children's story comprehension, language and early literacy learning.[10,11,12,13] Other researchers have developed e-books for research purposes.[14,15]

Key Research Questions

Several research questions have been addressed: (a) What is the quality of commercial e-books for children aged 3 to 8 years, with respect to structure and components? (b) What is the effect of e-book reading on children's language (mainly vocabulary and story comprehension) and early literacy development (including emergent word reading, word writing, phonological awareness and print knowledge), when considering the evidence on commercial e-books and those specifically created for research?

Recent Research Results

Research shows that many of the existing e-books are loaded with multimedia, colours, sounds, and graphics and also incorporate games in the story reading. In most e-books these features are not designed to promote young children's language and literacy development.[7,8,9] For example, there may be too many animations or the hotspots may not be related to the story, thus distracting from the child's story line understanding.

E-books specifically created for research have been used with children from different socioeconomic status (SES) groups,[14] children at risk for learning disabilities,[16] and children of different ages; furthermore, the children have experienced the books in different contexts such as independent child reading, joint reading of children in pairs, parent-child and researcher-child reading.[17,18,19] In these studies, e-books were found to be effective for promoting a broad range of language and literacy skills during the preschool and early school years.[15,20]

One recent meta-analysis concluded that well-designed e-books can facilitate children's story comprehension and word learning better than print storybooks.[21,22] Two types of design elements were important to the impact of the e-book. Multimedia elements added nonverbal information (animations, sound) to enhance understanding of verbal content (text, narration) and benefitted children's cognitive development as much as support from an adult while reading print storybooks. Multimedia features were especially helpful for children from disadvantaged families. However, interactive features that drew the child's attention away from the story were harmful to children's learning. This differential pattern was explained by young children's limited cognitive control and inability to multitask which is required in the case of interactive features. When children must switch frequently between the story and the interactive elements such as games and hotspots, the design of the e-book interferes with story understanding and language learning.[21,22]

Research Gaps

There is a need for more research on the contribution of e-books to aspects of spoken language, including vocabulary and story comprehension, and also on the effect of written text tracking in the e-book on children's print awareness, including emergent reading and writing, especially among kindergarten children. We need to deepen our understanding on the nature of child-child and adult-child joint processes and interactions and their effects on children' knowledge. In

addition, it is necessary to go a step further in suggesting an e-book system that assesses the child's language and story understanding level and suggests tutoring adjusted to the child's level. A digital tutor might make children more attentive to the story, similarly to the way they are when getting adults' support during shared book reading. Providing digital questions and feedback in an adaptive manner that focuses on language and story aspects might help young children's language and story comprehension.[23]

Conclusions

Listening to a story requires great cognitive effort by young children and additional activities in the e-book seem to distract them from the story line. Multimedia features such as animations, music and sound effects that closely illustrate the story content have been shown to facilitate children's understanding of the story, probably by depicting and concretizing the abstract language and directing children's attention to key details in the illustrations.[23] Such nonverbal information has been found to be especially helpful for children who experience problems in understanding the story line and language due to language delay. In contradistinction, interactive features that interrupt the story such as games, pop-up dictionaries and hotspots have not been found to be beneficial for young children's story comprehension even though these elements commonly appear in e-books.22

Implications for Parents, Services and Policy

Well-designed e-books based on research principles are needed. The current literature may serve as a good basis for software developers who can design e-books for the next generation, which can be both amusing and directed to language and literacy learning. Parents and educators need to exert caution when choosing an e-book for young children, and should keep in mind that in terms of interactivity and multimedia additions, "more is often less." Quality e-books can be used to support language and literacy learning in children who have normal or delayed developmental trajectories in these domains.

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