

DESIGNING A PICTURE E-BOOK INTERFACE WITH A READ-ALOUD FUNCTION TO IMPROVE ELEMENTARY SCHOOL STUDENTS' READING INTEREST

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ABSTRACT

This study used the online software system, Publuu, to design an e-book reading interface, with the aim of enhancing students' reading interest and motivation through applying the reading aloud strategy in the process of reading picture e-books. We used a pilot study to test our e-book interface design for this purpose. The participants were four elementary school fourth-grade students who experienced using the e-book interface to read the text and the picture of the assigned e-book material. Meanwhile, they were instructed to use the read-aloud strategy in order to enhance their interest in reading. The preliminary results showed that this e-book design helped enhance students' reading performance and interest in reading. In the future, we plan to further improve the e-book interface design for elementary school teachers to teach reading activities in the classroom.

KEYWORDS

Picture e-book, Digital reading, Read-aloud, Reading motivation

1. INTRODUCTION

With the advent of the digital era, new forms of books are constantly being introduced. Different forms of e-books such as picture e-book applications on mobile devices or web-based e-books are flourishing, and these texts and pictures are usually displayed with multimedia and interactive features (Kucirkova, 2019). Common functions of e-books include graphics, hotspots, narration, interactive buttons, non-linear reading, giving feedback, animations and multimedia media (Lim, 2021; Rubegni et al., 2021; Yang, 2013; Yokota et al., 2014; Zhang et al., 2020). The use of e-books in the teaching field can effectively promote reading motivation and reading effectiveness (Danaei et al., 2020; Lin et al., 2018; Takacs et al., 2015; Wu, 2016).

On the e-book reading interface, e-books usually have three major functions, namely zooming, hotspot, and page control buttons. In the study of reading interactive e-books, 80% of students think the page control button is very important, and the high autonomy of page turning also enhances the number of times they read back and forth (Lim, 2021). Hotspot clicks are the most important feature of e-books as they provide students with supplementary reading information. Through teachers designing hotspots in the reading story and limiting the number of hotspots, students are free to explore the hotspots after reading without distracting their attention (De Jong & Bus, 2004; Korat, 2009; Shamir et al., 2008). Johnston (2020) surveyed university students' habits of using e-books, and found that 9% of students thought that the function of enlarging the page was helpful for reading.

However, when using e-books in reading activities, teachers or researchers usually focus on reading or writing skills. For example, when Lim (2021) investigated how the use of interactive e-books by 30 secondary school students affected secondary school students' reading performance, 66% of the students agreed that the picture dictionary feature in the e-book helped with reading activities in terms of its effectiveness in aiding reading comprehension. In early reading experiences, if readers encounter difficulties with unfamiliar word recognition, it can be very challenging to read, which may result in lower comprehension of the story and lower willingness to read (Danaei et al., 2020), so adding hyperlinks to hotspots helps students understand the words in the text and reduces the reading difficulties of students who have low levels of reading literacy. Wu (2016)

developed an English reading e-book system that includes the functions of translation, pronunciation, reading and annotation to effectively and progressively improve students' reading comprehension skills through a personalized reading instruction mechanism.

Paivio's dual coding theory (1986) suggests that teaching materials can not only be presented visually, but also through voice input or output to help students achieve better learning outcomes. Altun (2018) investigated the effectiveness of reading e-books for pre-school children, and used story re-telling to test the students' reading levels. The relationship between practicing oral comprehension and text comprehension is relevant in the context of reading aloud, where comprehension of written text is stimulated through reading aloud, and the higher the level of engagement in the reading aloud activity, the more beneficial it is for language and reading development (Acosta-Tello, 2019; Batini et al., 2021). Therefore, this study will focus on the read-aloud strategy when designing and applying the interface features of picture e-books in reading activities.

In addition, Mayer (2003) proposed the multimedia learning theory, which provides a methodology for the production of effective teaching materials and guides instructors to design effective multimedia materials to reduce cognitive load. Therefore, this study drew on the dual coding theory and multimedia design theory to design the interface function of the electronic picture book used for this study.

This study used the online software system, Publuu, as the basis for the design and development of e-book materials, in the hope of helping students' reading scores and interest in reading. A prototype of the e-book interface was designed, and a pilot experiment was conducted to investigate the ease of use and applicability of the e-book interface, and to improve students' reading scores and interest in reading.

2. METHODS

The participants of this pilot study were four 10-year-old students (two girls and two boys) in fourth-grade of an elementary school in Taiwan. Since this pilot study was conducted to investigate the students' operational fluency of the e-book interface and their preliminary experience of the reading activity, no control group was used. To prepare the required materials and tools, we spent one and a half months using the Publuu software to redesign paper-based picture books into e-books, and designed multimedia functions according to our teaching objectives. The teaching objective was to provide a picture e-book interface with a read-aloud function to improve elementary school students' reading interest.

In the design process of the e-book, we firstly set up the interface with the software, and incorporated learning support functions into the reading interface, including free page flipping, hotspot, and page zooming, in the hope of enhancing students' comfort and ease of reading e-books and of reducing students' cognitive load. Secondly, in our didactical setting, we required the students to read aloud the text to engage them in the reading process. In order to do that, besides using the above functions of Publuu, we also used an "add links" function to link to external website to extend the functions of Publuu. The "add links" function could allow Publuu to connect to external websites. In our setting, the students use "add links" to connect to a teacher-assigned Google Drive folder. In this Google Drive folder, there are teachers' demonstration audio files. Students could listen to the demo first, then record their own versions of read-aloud videos with iPads. Listening to these demos might enhance their reading aloud fluency.

We spent four lessons on the pilot study, with each lesson lasting 40 minutes. To collect students' experience of using our e-book interface, interviews were conducted to evaluate the effectiveness of the reading activity.

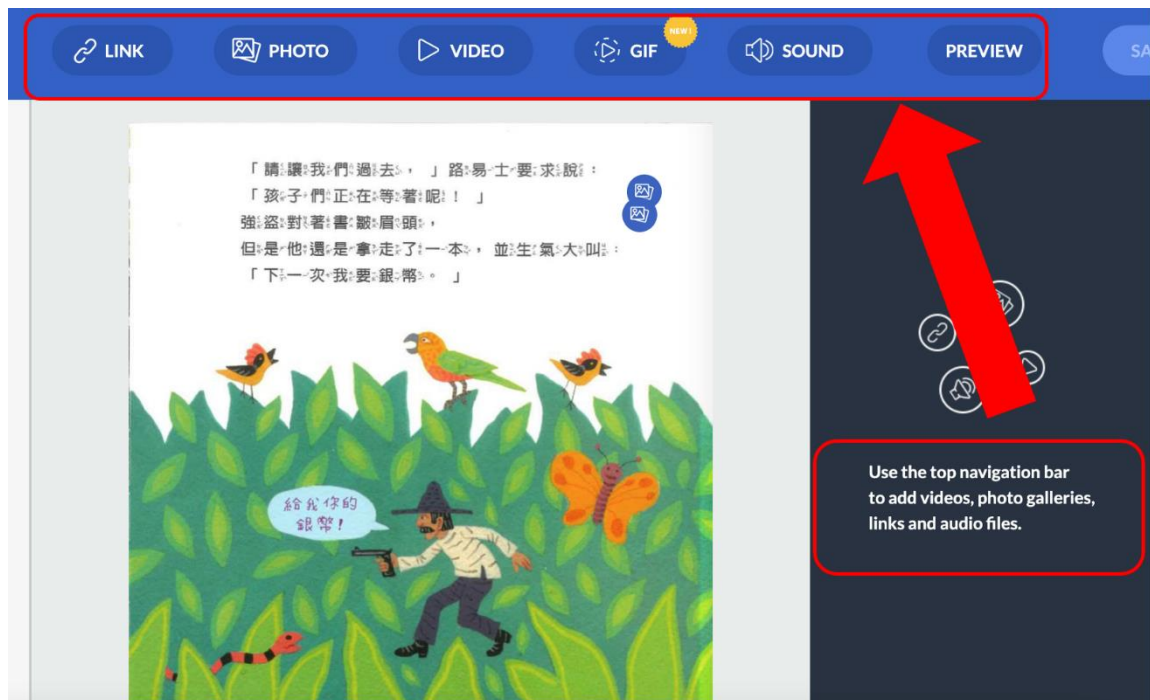


Figure 1. e-book Interface Design

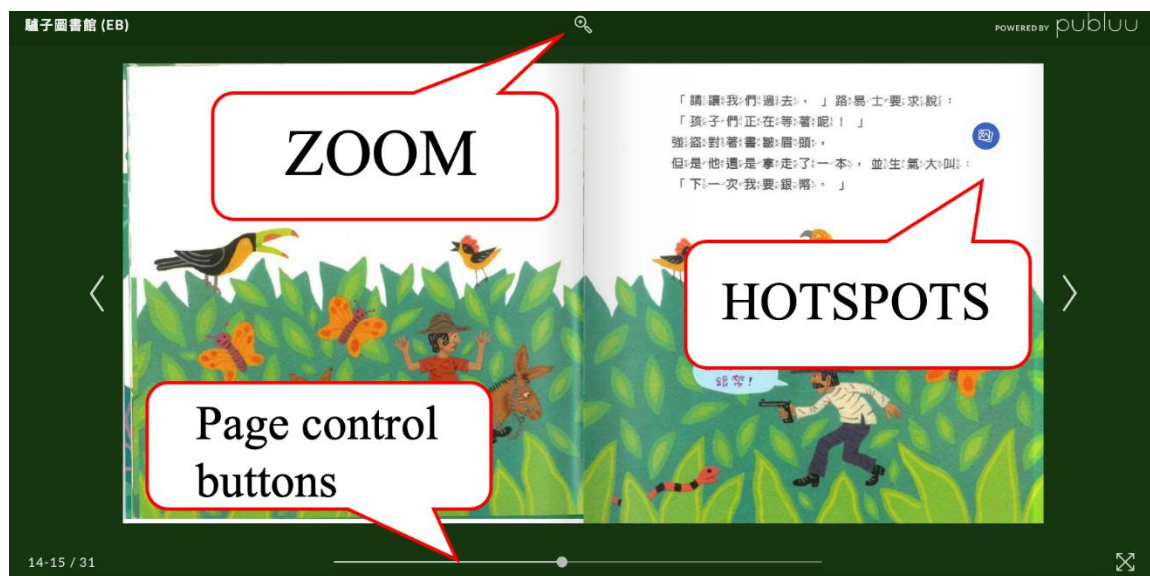


Figure 2. Reading Interface

3. RESULTS

The following observations were made after the pilot study. In terms of multimedia interface design, the reading interface design of the electronic picture book is highly relevant to students' learning. Based on pedagogical considerations, it is necessary to delete buttons that are not relevant to teaching activities so as to simplify the learning pages. In addition, after observing students' reading patterns, the page display was changed from single-page to double-page to help students' reading fluency or continuity, and to avoid discontinuous reading because the display of a single page was cut in half. All students responded that the page

magnification function is very different from the previous paper reading experience, as the text can be zoomed in on and the content can be seen more clearly. Hotspots need to be paired with story materials to help students solve word difficulties.

Through this research, the read-aloud strategy helped students' reading performance and facilitated the teacher's instruction. The results showed that the reading aloud function was new and interesting to the students. The teacher could evaluate whether the students were engaged in the reading activity by evaluating their reading aloud audio files. The result indicated that all students' read-aloud performance was better on the posttest. From the teacher's observations, the read-aloud strategy helped the students' reading fluency. The teacher found that the students' reading performance in normal classroom reading activities was also improved after participating in this pilot study. In the interview, students reflected that telling a story in a dramatic way is an interesting experience. In the past, seldom had students' oral reading performance been recorded, meaning that students had no chance to listen to their own or to others' voices.

4. CONCLUSION

In this study, based on our pedagogical considerations, we proposed a new way of using Publuu. We designed a picture e-book interface combined with a read-aloud function for elementary school children. The teacher observed that the reading performance of the students was improved and their interest in reading was enhanced, especially for students with lower levels of reading literacy. In the future, we will adjust the design of this current picture e-book interface based on our observations, and perform a formal experiment to further test our hypotheses. It is expected that the e-book interface can be used for students of different ages and backgrounds, to provide interesting experiences for readers. In particular, using an e-book interface with a read-aloud function has the potential to further boost elementary school children's reading motivation and performance.

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