

Interface Evaluation of Web-Based e-Picture Books in Taiwan

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Abstract. Web-based e-Picture books can integrate the elements of multimedia and offer the special reading experience that is different from printed picture books. The research aims to understand the development status of three e-picture book websites in Taiwan and give recommendations for improvement. Through 1) 12 adults who filled out the questionnaires about browsing e-Picture books; and 2) 10 surveyed (two teachers, two parents and six children) who were observed in their operation and given in-depth interviews, the research analyzed three interface designs of e-picture websites in Taiwan: “Guru Bear Parent-Child Common Reading Network: Dear Bear Reading Room”, “Kiddo Book” and “CCA (Council for Cultural Affairs) Children Cultural Center: Picture book Garden”. The results of analysis were: 1) most of them were flipping pattern; 2) primarily linear development; 3) less interactive; 4) most of them were adapted from physical printed books; 5) it is difficult for children to register additional account and install browsing software. The recommendations for future publishers and designers were: 1) increase the interaction of the story; 2) Make good use of multimedia interactive design elements; 3) Enhance user control; 4) Integrate e-Picture Book platform; and 5) create all-new e-Picture books.

Keywords: e-Picture book, e-Storybook, e-Book, Usability.

1 Introduction

After the launch of iPad by Apple, the e-Book market has reach climax. The e-Books in the current markets could mainly refer to the e-Book readers that every manufacturer has their own specifications. But most of the e-Books present themselves on the reader in the form of static image and text, or even only the electronization of printed books. So strictly speaking, there are few e-Books that use multimedia elements and interactive design to design exclusive contents for the e-Book. Being not able to recognize the words, pre-school children usually look at the colors and patterns with high novelty. E-Picture book is drawing-based, supplemented

by a small amount of text and could be a helper for cultivating reading habits. It combines multimedia elements plus convenient online platform to design e-Picture book. From the aspect of creation, production and browsing, it is a new try and challenge that could transmit and distribute by an economic and convenient way and provides reading contents that have different media expression and sensory stimulation. The research selected three e-Picture books websites in Taiwan to conduct interface design, evaluation and analysis and understand the current situation of development before providing recommendations for improvement.

2 Literature Review

2.1 Electronic Book

An electronic book is a text and image-based publication in digital form produced on, published by, and readable on computers or other digital devices (Wikipedia, n.d.). The Chinese term “electronic book” is directly translated from English. In literature, Van Dam mentioned electronic books for the first time. In a broad sense, it means the media that stores and transmits the characters and pictures information through electronic channel (Lwo, 1995). Barker (1992) argued that the electronic book was used to describe new type of books that was different from traditional paper books. But like paper books, they were composed of pages. The difference was that each page of an electronic book was designed and dynamic electronic information. Electronic book could be considered an aggregation of multi-pages, responsive and lively multi-media (includes information of characters, picture or voice). A picture book is an art form that combines visual and verbal narratives in a book format. A true picture book tells the story both with words and pictures. Electronic picture book (or e-Picture book, EPB) is to present picture books in the electronic form including CD-ROM, WWW. The applied multi-media elements include characters, pictures, animations, voice, sound effects and music. It mainly operates through mouse and keyboard in user control (interactive operation pattern). The manipulation of mouse includes drag and click whereas the manipulation of keyboard I includes character enter and key enter. The source of story materials includes adaptation and creation. The e-Picture book of the present invention includes a plurality of pages graphically depicting or telling a story. The e-Picture book in the research means the web-based e-Picture book.

2.2 Usability

Usability is the ease of use and learnability of a human-made object. Lazar (2006) highlights ease-of-use as an equally important usability consideration he also advocates for a balanced approach to Web design that allows for the appropriate use of media elements such as graphics, plug-ins, and animation. Schneiderman (1993) emphasizes consistency and predictability in interface design that provides for a high

level of user control. Usability means that the people who use the product can do so quickly and easily to accomplish their own tasks. This definition rests on four points: (1) Usability means focusing on users; (2) people use products to be productive; (3) are busy people trying to accomplish tasks; and (4) users decide when a product is easy to use. (Dumas & Redish, 1999)

Usability is the quality of attribute that assesses how easy user interfaces are to use. The word "usability" also refers to methods for improving ease-of-use during the design process. Usability is defined by five quality components: (1) Learnability: How easy is it for users to accomplish basic tasks the first time they encounter the design? (2) Efficiency: Once users have learned the design, how quickly can they perform tasks? (3) Memorability: When the users return to the design after a period of not using it, how easily can they reestablish proficiency? (4) Errors: How many errors do users make, how severe are these errors, and how easily can they recover from the errors? (5) Satisfaction: How pleasant is it to use the design? (Nielsen, 2003)

In conclusion, a usability analysis can tell us which part of page users view first, how long they stay and where they go next. Usability is about analysing how a user interacts with a website and using that information to make the website as user-friendly as possible.

3 Method

3.1 Procedure

1. Browse separately assigned e-Picture books (two for each type of each website).
2. Conduct questionnaire surveys and interviews through five-point Likert items: a. strongly disagree; b. disagree; c. neither agree or disagree; d. agree; e. strongly disagree. The contents of questionnaire include the satisfaction with the items such as overall page design, convenient to find e-Picture books, easy to operate, appropriate size of footage of story, animation design of story, suitable for children on their own operations. The primary contents of interviews focused on the questions on the e-Picture operations in different websites to understand the reason of satisfaction or dissatisfaction.

3.2 Subjects

1. 12 adults filled out the questionnaires (their education background included ten graduated from the children education related departments, two from the department of the Chinese language and literature; the occupations included three mothers who had young children, two kindergarten teachers, two elementary school teachers, five early childhood education educators).
2. 10 people included six children (one 10-year-old boy, one 10-year-old girl, two 7-year-old boys and two 7-year-old girls), two kindergarten teachers, two parents were received one-to-one in-depth interviews on the e-Picture books they had browsed. Among them, four adults were picked up from the adults who had filled out the questionnaires.

Table 1. Comparison of three e-Picture book websites in Taiwan

	Guru Bear Parent - Child Read Together Net 咕嚕熊親子共讀網：熊熊閱讀室			Kiddo book 奇豆線上書房	CCA Children Culture Hall - Picturebook Garden 兒童文化館：繪本花園
Website	http://www.gurubear.com.tw/			http://www.kiddobook.com/	http://children.cca.gov.tw/garden/
Establishment Time	2008.07			2006.12	1999.09
Membership Registration	✓			✓	
Install Browsing Software				✓	
Fee	✓ Need credit for reading and earn credit for publishing article			✓ NT\$290/month	Free
Trial Subscription	✓ 3 trial subscriptions per category			✓ 6 books trial subscription	The contents of trial subscription is not complete version
	Inactive English Picture book	E-Live Picture book	Electronic Book		
Story Amount	24	27	35	111	144
Story Voice	✓	✓	✓	✓	✓
Story Animation	Good	Better	None	Limited	Better
Extension Activities	•Interactive Learning			•Game zone •Three-dimensional play zone •Creation zone	•Game (each story) •Reading guide (each story) •Discussion (each story)

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Fig. 1. Example of Inactive English Picturebook



Fig. 2. Example of Kiddo book



Fig. 3. Example of CCA Children Culture Hall - Picturebook Garden

4 Results and Conclusions

Summing up the results of questionnaire and interviews and list as follows:

1. The Design of Website Homepage. The three websites get not bad evaluation. The average scores are above 3.6.

2. The Design of Interface

The e-Picture book of “Kiddo Book” needs extra installment of browsing software and has more options of interactive functions, the average score of manipulation design is the lowest in all websites. The interface design of “Kiddo Book” is considered by users as the best one. It provides switching of previous/next pages, options of different captions (English/Chinese/Chinese plus phonetic notation), options of text location, play/pause, automatic/manual, etc., that is, it provide more user’s control.

3. the Screen Size of e-Picture book

The screen size of “Children Culture Hall” and “Guru Bear Parent - Children Read Together Net - Interactive English Picture book” are the smallest and their average scores are the lower. The e-Picture book of “Kiddo Book” is playing in almost full screen and get highest score 4.7.

4. the Design of Story Animation

The story animation of “Guru Bear Parent - Children Read Together Net – E-Live Picture Book” and “Children Culture Hall” has more camera effects and dynamic expression of characters and gets higher scores.

5. Story Voice

“Guru Bear Parent - Children Read Together Net – E-Live Picture Book” and “Kiddo Book” are most highly praised by interviewers. The dubbing of different roles is different.

6. Whether suitable for children to self-manipulate

“Kiddo Book” needs extra installment of browsing software, so it obtains the lowest score 2.4. “Children Culture Hall” need not to register user’s name and most easy to manipulation, so it obtains the highest score 4.2. Four 7-year-old interviewee children indicated that it is difficult for them to register user’s name and had no such experiences. It is also difficult for all children to install software for viewing the picture books.

As a whole, there were following common points in the designs of e-Picturebooks: a) flipping pattern; b) linear story; c) insufficient interaction; d) most of them were adapted from printed books; e) needed extra registration account number and installment of browsing software that was difficult for children. So far, there have not yet been the most satisfactory design for web e-Picture book and there still are much space for improvement.

Table 2. Analysis of of Questionnaire Statistics

N=12	Mean	S.D.	Min	Max
Q1-1	4.0	0.603	3	5
Q1-2	3.6	0.900	2	5
Q1-3	3.8	0.622	3	5
Q2-1	3.4	0.996	2	5
Q2-2	3.3	0.754	2	4
Q2-3	3.8	0.577	3	5
Q3-1	3.3	0.622	2	4
Q3-2	4.1	0.515	3	5
Q3-3	3.8	0.452	3	4
Q3-4	3.0	0.739	2	4
Q3-5	4.0	0.739	3	5
Q4-1	2.5	0.798	1	3
Q4-2	3.0	0.853	1	4
Q4-3	3.8	0.754	2	5
Q4-4	4.7	0.492	4	5
Q4-5	2.6	0.900	1	4
Q5-1	3.1	0.669	2	4
Q5-2	4.0	0.953	2	5
Q5-3	2.7	0.888	1	4
Q5-4	3.6	0.996	2	5
Q5-5	4.0	0.739	3	5
Q6-1	3.2	0.937	1	5
Q6-2	3.8	0.866	2	5
Q6-3	3.9	0.515	3	5
Q6-4	2.4	0.996	1	4
Q6-5	4.1	0.793	3	5

5 Suggestions

1. Increase the interaction of story

The e-Picture books in the three websites were adapted from physical printed books that the publishers operated them for nothing more than the added-values of original publications. Most of story contents are linear developments that lack of interaction. In future, they should bring the advantages of multimedia and web into the full play and increase double or multi-routes of story development to strengthen the interactions between the readers and story contents.

2. Make good use of multimedia interactive design elements

The e-Picture book should emphasize more on the use of multimedia interactive design and allow the readers have the reading experiences that are different from the printed books. Unfortunately, the performance on the multi-media by existing e-Picture books in three websites was not, on the contrary, good as Living Books series. So they should make good use of the advantages of web version to interact with their readers to extend reading activities.

3. Enhance user control

“Kido Book” provides the function options including page up and down switch, different subtitle options (English/Chinese/Chinese plus phonetic notations), options of text location, play/pause, auto/manual play. It provides the most user controls in the three websites. Most of the surveyed recommend that it increase the control options of the size of screens and subtitles that the users could decide by themselves the size of picture and subtitle, that is, it enhances the users’ control power.

4. Integrate e-Picture Book platform

At present time, most of e-Picture Books websites in Taiwan are operated by the publishers, some even need to install browsing software for reading that is not convenient to the readers. In future, they should construct an integrated platform that the e-Picture Books from different publishers could be read by the users at the same time. It would not need to set different accounts and could further to reach the goal of mutual exchange and healthy competition.

5. Creative All-new e-Picture book

Most of the existed e-Picture books came from the adaptation of physical printed picture books that is the digitalization of existed publications. They usually use scanning method to process the images or part of images were processed through simple animation and nothing else. It is pity that they did not consider the creation of e-Picture books from the angle of multimedia elements and interaction. So the creation and publication of all-new e-Picture books should be encouraged.

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Appendix: The Results of Questionnaire Statistics

Questions	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12	Ave	SD.
I like the website design of "Guru Bear Parent-Child Read Together Net"	4	4	4	4	3	3	5	4	4	4	4	4	4.0	0.603
I like the website design of "Kiddo Book"	4	4	5	2	3	3	4	5	3	4	3	4	3.6	0.900
I like the website design of "Children Culture Hall"	4	4	4	4	3	5	3	3	4	3	4	4	3.8	0.622
I can find the e-Picture book of "Guru Bear Parent-Child Read Together Net" easily	2	4	4	4	2	4	5	2	4	4	3	3	3.4	0.996
I can find the e-Picture book in "Kiddo Book" easily	4	3	4	2	2	3	4	4	3	3	3	4	3.3	0.754
I can find the e-Picture book in "Children Culture Hall easily	4	4	3	5	4	4	3	4	4	4	4	3	3.8	0.577
I feel easy to manipulate "Bear Reading Room — Interactive English Picture book" in "Guru Bear Parent-Child Read Together Net"	4	3	4	3	3	4	3	2	3	4	3	3	3.3	0.622
I feel easy to manipulate "Bear Reading Room — E Live Picture book" in "Guru Bear Parent-Child Read Together Net"	4	5	4	4	3	4	4	5	4	4	4	4	4.1	0.515
I feel easy to manipulate "Bear Reading Room — Electronic Picture Book" in "Guru Bear Parent-Child Read Together Net"	4	4	4	3	3	4	4	4	4	4	4	3	3.8	0.452
I feel easy to manipulate "Kiddo Study Room" in "Kiddo Book"	4	3	4	2	3	3	2	2	3	4	3	3	3.0	0.739
I feel easy to manipulate "Picture book Garden" in "Children Culture Hall"	4	4	3	5	4	5	3	4	4	5	3	4	4.0	0.739
I feel the screen size of "Bear Reading Room — Interactive English Picture book" in "Guru Bear Parent-Child Read Together Net" is appropriate	2	3	4	3	3	2	2	1	2	3	2	3	2.5	0.798
I feel the screen size of "Bear Reading Room — E Live Picture book" in "Guru Bear Parent-Child Read Together Net" is appropriate.	3	3	4	4	3	2	4	1	3	3	3	3	3.0	0.853
I feel the screen size of "Bear Reading Room—Electronic Picture book" in "Guru Bear Parent-Child Read Together Net" is appropriate	2	4	4	5	4	3	4	4	4	4	3	4	3.8	0.754
I feel the screen size of "Kiddo Study Room" in "Kiddo Book" is appropriate	5	5	5	4	4	5	5	4	5	5	4	5	4.7	0.492
I feel the screen size of "Picture book Garden in "Children Culture Hall" is appropriate	4	3	3	3	2	2	2	1	2	4	2	3	2.6	0.900
I like the story animation of "Bear Reading Room — Interactive English Picture book" in "Guru Bear Parent-Child Read Together Net"	4	3	3	4	3	4	2	2	3	3	3	3	3.1	0.669
I like the story animation of "Bear Reading Room — E Live Picture book" in "Guru Bear Parent-Child Read Together Net"	4	5	5	5	4	2	5	4	4	4	3	3	4.0	0.953
I like the story animation of "Bear Reading Room—Electronic Picture book" in "Guru Bear Parent-Child Read Together Net"	3	4	4	3	2	3	3	1	2	2	3	2	2.7	0.888
I like the story animation of "Kiddo Study Room" in "Kiddo Book"	5	5	4	3	2	5	3	3	3	3	4	3	3.6	0.996
I like the story animation of "Picture book Garden" in "Children Culture Hall"	4	3	3	4	4	4	4	5	5	5	4	3	4.0	0.739

Questions	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12	Ave	SD
I think it is suitable for the elementary school children to self-manipulate "Bear Reading Room – Interactive English Picture book" in "Guru Bear Parent-Child Read Together Net"	3	4	4	5	3	3	3	1	3	3	3	3	3.2	0.937
I think it is suitable for the elementary school children to self-manipulate "Bear Reading Room — E Live Picture book" in "Guru Bear Parent-Child Read Together Net"	2	4	4	5	3	4	4	5	4	4	3	3	3.8	0.866
I think it is suitable for the elementary school children to self-manipulate "Bear Reading Room—Electronic Picture book" in "Guru Bear Parent-Child Read Together Net"	3	4	4	5	3	4	4	4	4	4	4	4	3.9	0.515
I think it is suitable for the elementary school children to self-manipulate "Kiddo Study Room — Electronic Picture book" in "Kiddo Book"	2	4	4	2	3	2	1	1	2	3	3	2	2.4	0.996
I think it is suitable for the elementary school children to self-manipulate "Picture book Garden — Electronic Picture book" in "Children Culture Hall"	5	4	4	5	3	5	3	4	4	5	3	4	4.1	0.793