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USABILITY CONSIDERATIONS MAKE DIGITAL INTERACTIVE BOOK POTENTIAL FOR INCULCATING INTERPERSONAL SKILLS

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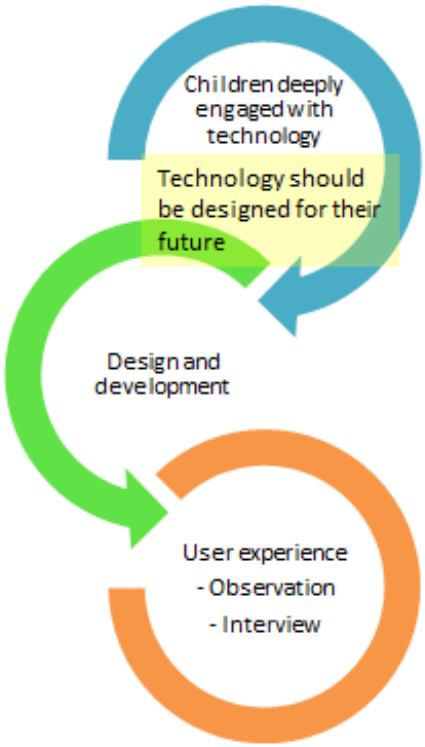
Graphical abstract



Abstract

This paper reports on an initiative that discovers the potentials of digital interactive books or digital storytelling in developing and inculcating interpersonal skills among children. The rationale for such initiative is to help designing technology for good deeds for the children, who are the future leaders, because they are very much engaged with technologies. Hence, this paper aims at discussing the potentials of digital story-telling in developing the interpersonal skills among children. To achieve that, first, a prototype was designed, and then let users to experience it. Data were collected through observation and interview. In the end, it was initially found that the digital interactive book is potential in inculcating interpersonal skills among children.

Keywords: Usability, digital storytelling, potentials, interpersonal skills

Abstrak

Kertas kerja ini melaporkan satu inisiatif yang meneroka potensi buku interaktif digital atau penceritaan digital dalam membina dan memupuk kemahiran interpersonal di kalangan kanak-kanak. Rasional inisiatif ini adalah bagi membantu merekabentuk Teknologi bagi kegunaan kanak-kanak, iaitu bakal pemimpin akan datang, kerana mereka mempunyai kaitan yang utuh dengan Teknologi. Justeru, kertas kerja ini memfokus bagi membincangkan potensi penceritaan digital dalam membina kemahiran interpersonal di kalangan mereka. Bagi mencapai hasrat itu, langkah pertama ialah mereka bentuk dan membangunkan sebuah prototaip, yang kemudiannya diguna oleh kanak-kanak bagi mendapatkan pengalaman sebenar. Data dikutip melalui pemerhatian dan temubual. Di akhir kajian, penemuan telah menunjukkan bahawa penceritaan digital berpotensi memupuk kemahiran interpersonal di kalangan kanak-kanak.

Kata kunci: Kebolehgunaan, penceritaan digital, potensi, kemahiran interpersonal

1.0 INTRODUCTION

Pre-school children are strongly influenced by electronic media. TV is very famous, and almost owned in all households. The children spend most of their time with TV, and imitate the contents on TV. This is because the contents on TV interest them [1]. In terms of learning activities, a study needs to be carried out to make learning interesting for the children. While digital interactive book has been widely used among children, because it conveys information easily [2] and interestingly [3-4], its potential in inculcating interpersonal skills can also be manipulated. In fact, one of the goals of interaction design, through its design value section aims at supporting the enrichment of interpersonal skills [5]. Hence, this study explores the potentials of digital interactive books in such potentials.

In current situation, children are engaged deeply with computers and computer applications. They are exposed to gadgets since their early childhood. In fact, some parents use gadgets to win their children. As a result, children have less space to participate in real world as opposed to the virtual world. Consequently, they do not develop their ability in participating in real conversations [6]. In regards to this, the society has to view it as a drawback because in such lacking (in the interpersonal skills), the children have missed their soft skills development, one of very important elements in facing the real society [7].

In current practice, the inculcation of interpersonal skills is accelerated through workshops and formal classes. This study has no intention to replace such approaches, but to complement them so that every child could have opportunities to render skills in participating with their peers. For such purpose, digital interactive book is hypothesized as a potential tool, provided that sufficient design guidelines are well-incorporated into it as expressed by Cooper, Reinmann, and Cronin [5]. Digital interactive book is possible for such purpose because it has been proven as beneficial in encouraging children to actively participate in learning [8]. Having considered that, this study designed a digital interactive book by considering the design guidelines in Table 1, which has been derived by Adi Lukman, Ariffin, Mohd Nizam, and Ainuddin Wahid [9].

Table 1 Applied Design Guidelines in the Digital Interactive Books

Design guideline	Descriptions
Content	• Consist of a few chunks of topics. • Simple and map children's existing knowledge. • Each topic is short. • Arranged according to thematic, increasing level of complexity, sequences of process, and the like. • Include elements within children's mental model.
Media elements a. Text	• Use large fonts – such as 18-points. • Make sure the difference between the background and fore-ground is obvious. • Make sure the fonts are clear, use sans serif. • The fonts must be simple, use wide character-fonts such as Bookman Old Style. • Make sure there is no mistake.
b. Audio	• Pronunciation must be clear, slowly, and right with emphasis, tone, and stress. • Obvious difference between the background audio, audio alert, and the content. • Good to be repetitive. • User can control the audio.
c. Visual (graphic, animation, images, video, etc.)	• Use of multiple colors. • Use only appropriate animation. • Make sure the visual elements are standard. • Use suitable metaphors for children.
Interactivity	• Maintain the standard. • Provide sign post. • Provide audio alert. • Provide visual alert. • It has to be minimal. • Encourage the use of mouse or touch screen. • Buttons must be obvious. • Use clear instructions. • Avoid hierarchy.

Language	• Use simple sentence structure. • Use short sentences. • Good to repeat. • Provided in written and audio forms.
Methods	• Listen – allow children to listen to narration. • Read – encourage children to read the texts on screen. • Witness / observe – Invite children to witness the characters in the learning material. • Speak – invite children to speak-together, such as singing and count. • Move – encourage children to move their body, such as clap their hands, and nod their heads.

2.0 METHOD

In accomplishing the aim, this study has gone through a three-phase process outlined in Figure 1. First, the digital interactive book was designed incorporating the guidelines in Table 1. Having finalized the design, the digital interactive book was developed. Users were involved in the designing and development stages, in six seminars of User-centered Design (UCD) approach. Each seminar has a specific purpose: Seminar 1 – was aimed at gathering the instructional and multiple intelligence elements for interesting digital story-telling; Seminar 2 – was aimed at detailing the content dimension; Seminar 3 – was aimed at enriching the media elements dimension; Seminar 4 – was aimed at detailing the interactivity dimension; Seminar 5 – was aimed at detailing the language dimension; Seminar 6 – was aimed at detailing the method dimension.

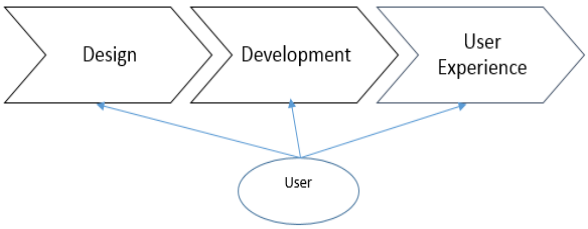


Figure 1 The three-phase process

In user experience testing, the users (children) first experienced the digital interactive books. It was carried out with help of their teachers, in which three pre-schools were involved (the same schools those involved in the six seminars). In their classroom setting, their teachers run their classrooms as usual. While the children experiencing the digital interactive books, this study observed their behavior and later asked them some enriching questions.

3.0 THE DIGITAL INTERACTICE BOOK

For the purpose of initially determining the potential of digital interactive books as a tool for inculcating interpersonal skills among children, this study focus the design guidelines on the structure, layout, navigation, and media elements. They have been embedded in the prototype as detailed in the following subsections.

3.1 Structure and Layout

In terms of layout and structure, the digital interactive book is ensured consistent. This is seen through the provided figures. The display is plain, avoiding massive interface (the cover is displayed in Figure 2); at the same time keeping the navigation elements close at hand.

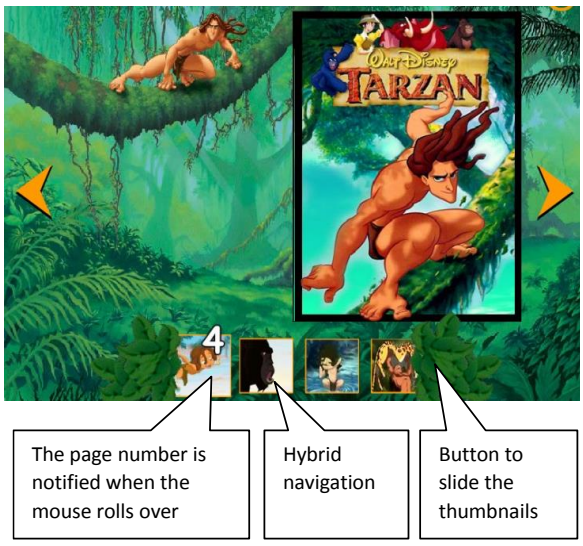


Figure 2 The three-phase process

3.2 Navigation

In terms of navigation, Figure 3 illustrates that the page contains buttons (in page miniature) for hybrid navigation, which allows users to move to different pages with a single click. This is applicable especially for users who have read the book. If the miniature page they want to go to is invisible, they can place the mouse pointer on the leaves on the left or right of the miniatures. This makes the miniatures slide either

to the left or right accordingly. They do not have any problem to identify the page because every time they roll the mouse over, besides the miniature expands, they also notify the page to jump to. In contrast, if the users want to move between pages linearly (such as the first time reading), they could use the linear navigation button as indicated in Figure 3.
Not only navigating using the provided buttons, users could also manually flip the page. When they drag the page from the right-bottom vertex, they could play with the page flipping as shown in Figure 4, which is very arousing (touching modality). Also, users could move the pages in reverse order, if they want to. Similarly, both linear and hybrid navigation are provided for them, that gives similar page flipping effect.

3.3 Media Elements

Figure 5 displays a button to turn the audio ON and OFF. Users are provided with the button because some people expect for the audio while there are also some who do not. In this interactive storytelling, the contents (text) are read aloud for the users. It supports users in two ways, (1) for users (children) who are not able to read yet, and (3) for users (children) who can read, this trains them to read quickly. Not only that, in some pages, appropriate audio cue and sound effects are incorporated, such as Tarzan screaming, water splashing, elephant, tiger, and such the like. It is important to enhance the reading interest [10] through the supports for seeing and listening modalities [11].

Figure 3 Page flipping

Figure 4 Manual flipping

Figure 5 Text and graphics

Figure 6 Text, animated graphic, and video

Figure 5 also visualizes the text and graphic elements. As outlined in the guideline (Table 1), they are tailored for the children. Figure 6 illustrates a

combination of text, animated graphic, and video on the pages. In the pages, the video enhances the text content. The video is also incorporated with sound effect. In the developed digital storytelling, the dialogues are addressed by respected actors. This intensifies the audio effect to the readers. The layout of the combined text, graphics, and video can be different. This is an element that this study calls 'sparkling cognition'. It refers to the tuning of attention, from one representation to another representation.

3.3 Others

Besides those tangible elements, the developed interactive book also emphasizes on the orchestration among the elements. It is seen that all elements are nicely blended together; making every page up as a single canvas that conveys meanings to the readers. Referring to the navigation, it is noticed that users do not have to do unnecessary mouse click to get to the content. In most cases, they just perform a single click for certain content. On top of that, the terminologies used in the storybook are commonly experience by the users. This study avoids anything that is not within children's locus of knowledge. Nevertheless, when there is an intention to encourage children to learn new thing, it is included in the developed interactive book.

4.0 FINDINGS AND DISCUSSION

Having observed and interviewed the children in the user experience testing, this study was very impressed. Some feedbacks were addressed by their children. Besides the usability of the developed prototype, for the purpose of this paper, the emphasis is more on the inter-personal skills aspect.

Through observation, this study found that the children were happily enjoying the inter-active book. They read aloud together, and sometimes they chat with their peers. While they browsed the book at everyone's convenience, they discovered the contents with various media elements at different time. Accordingly, their excitement was continuously ex-pressed, because the various elements in the book support every child [12]. It was also seen that they speak together with the book, and screamed together with Tarzan, as seen while they watch TV [13]. This study found that the sessions were very lively, and fun, which agrees with Ariffin and Norshuhada [14]. In fact, that is one of the purposes of digital books [15].

When interviewing them, the children expressed that they were very happy with the digital interactive book. They addressed that it was a new experience, because they have appropriate space and opportunities to do activities collaboratively with their peers. It is not like usual, with the digital interactive book, they were willing to assists their peers when asked, as found in gaming by Bernhaupt, Schwaiger, Riegler, and Enthaler [16]. This contrasts the normal practice, in which they were not confident to express ideas, letting teachers to role in all situations [17].

On top of that, their teachers expressed their excitement after experiencing the sessions with their children. From their view, their children were engaged in the sessions deeply. In terms of interpersonal skills, the children were found different that that with conventional books. Obviously, they were more confident to present themselves. In fact, children who used to be very quiet in class changed, into someone who have the desire to dominate the session. On one hand it looks quite drastic; on the other hand, it is very positive because it develops children's internal spirit. Not only that, it also leads to an appropriate context for teaching and learning purposes.

This is very important, to avoid children from lost in the technology without any social benefit. It has always been seen that children engage in the technology, and letting hours passed by, without eventually gain any benefit. Cumulatively, a huge amount of time is spent by every child every week, resulting in a giant-sized hour wasted unbenefited. As future leaders, their lifestyle has to be appropriately handled. It is true that we could not avoid them from going along with the technology; hence, designing the technology for good deeds is our major task.

5.0 CONCLUSION

This study agrees with the previous works on digital interactive books [18]. While the content and user interface could be made pleasing to users, so that the artefacts are usable, developing it is also less technical [19-20], enabling everyone to develop. As an interactive book, considerations on the interactivity have to be among important things for designers to put the eyes on. Jesse [21] and Elsom-Cook [22] in this context recommend that the interactivity must be tailored specially to meet the requirement of both, the artefact being developed and the users so that it supports user experience. With that, it further engages the users in the flow [23-24]. Besides, the use of various media elements supports multimodalities, that supports various user preferences [25-26].

While the previous studies have proven the potentials of digital storytelling or digital interactive books in learning and teaching, this study initially discusses that the digital interactive books also potentially supports the development of interpersonal skills. As this is an initial study, it is expected that this initiative is further extended in the future.

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