

Interactive Content Development for First Aid and Home Treatment e-Book

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Abstract

“First Aid and Home Treatment Interactive e-Book” is a novel interactive e-book that can be viewed by the public who are frequently carry out their activities at home area. It consists of four modules of common accidents that will occur at home area, which are ankle sprain, hot water burn, animal bites and infant choking. Due to the lack of first aid knowledge in some people and less attraction on conventional approach in giving first aid information such as books, flyers and videos, this interactive e-book helps the reader to learn some basic knowledge on first aid to treat the most frequent basic medical problems. The objectives of this project are to identify the common injuries and the first aid knowledge for the treatment of the injuries, in addition to integrate the basic first aid knowledge and finally, to develop an interactive book that give understanding to the readers about the first aid and home treatment. Furthermore, the project aims to evaluate the acceptance of the interactive book for first aid and home treatment with the medical practitioners and other target users. The methodology of this project consists of five phases which are analysis, design, development, implementation and evaluation. It is envisaged that the interactive e-book are attractive, easy to understand and enable the users to apply the treatment to the real situation.

Keywords: *E-learning, First Aid, Home Treatment, Interactive e-Book.*

Introduction

First aid aims to help a sudden sick or injured people by giving them an instant or temporary treatment to promote the recovery and prevent the condition from becoming worse. According to American Safety and Health Institute ^[1], injuries and illnesses kill more than 2.2 million people in the world each year at work. This is the same as at home when people do not know how to take the right action for the injury. Thus, the knowledge of the basic medical assistance on first aid is important for everyone to learn and to prevent further injuries or illnesses.

This project aims to create a “First Aid and Home Treatment Interactive e-Book”, in an interactive approach which suitable for the public. “First Aid and Home Treatment Interactive e-Book” is an electronic book that consists of the basic medical assistant to get the immediate treatment for injury. The interactive e-book is full of interactive elements and is easy to learn.

It is recommended to view the file in Adobe Acrobat or Adobe Reader with at least Acrobat 9 or Reader 9 or later.

There are two problem statements that contribute to the development of this project, which are the lack of medical assistance knowledge and the conventional approach in conveying medical assistance information. According to Harvey^[2], a minority of people living in New South Wales know the optimal time for cooling a burn injury and other appropriate first aid steps for burns. It shows that most of the people still do not know how to treat the burn injury. In addition, Khatatbeh^[3] revealed that the first aid knowledge among students at Yarmouk University was considered to be insufficient, as there was only 11 percent of the participants knew about the correct respiratory rate.

In this project, an application “First Aid and Home Treatment Interactive e-Book” was created for the

public who are frequently carry out their activities at home area with three main objectives. The first objective is to educate public on first aid treatment using e-book approach, secondly, to develop an interactive book that give understanding to the readers about the first aid and home treatment and finally, to integrate the basic medical assistance on first aid in treating the most frequent basic medical problems. There are four modules covered in this project, which are ankle sprain, hot water burn, animal bites and infant choking.

The process of creating this electronic book is by implementing five phases which are, analysis, design, development, implementation and evaluation. The main software used to create this interactive e-book project is Adobe InDesign. Some basic medical assistance is applied to the real situation through this first aid and home treatment interactive e-book. The final product is an interactive e- book that will be used by the public who want to learn some basic medical assistance and apply to the real situation through the development of this first aid and home treatment interactive e-book.

Related Work

An e-book can be defined as electronic book which is a digital form of book that require a reader or device. According to Shiratuddin and colleagues^[4], the paper books had been converted into a digital format through digitizing processes to form an e-book and allow them to be displayed on computers. In the report by Leaf^[5], the definition of the e-book is an online version of printed books that accessed via the internet.

E-book consists of hardware and software as its basic components, where the hardware is the reader. Tosun^[6] stated that e-books can be displayed on many reading devices and tools, such as Kindle, Iriver eBook Reader, eInk, as well as desktops, mobile phone, iPads or tablets. Brajković ^[7] claimed that the electronic book consists of various types of media, such as text, images, video, audio and animation, and those contents are called software components in the e-book. Munawwarah and colleagues^[8] developed an interactive e-book of teaching material for electrochemistry, which consists of animation, task and quizzes that involved the interaction of students directly. An e-book can be interactive by having the interaction between user and the e-book, which called interactive e-book. A recent

report by Woodward ^[9] claimed that the multimedia and interactivity of an interactive e-book is a further area for delivery of content and innovative design. This is a way for the users to improve their experience of engaging with texts by accessing to interactive images or any functionality that make interactive between the user and the e-book.

One of the advantages of using e-book is it is easily readable. It is an ideal format for those who have seeing difficulty by zoom in on the specific sections or alter the size of the font^[7]. In addition, e-book can have interactivity, which enable users to interact with the storyline in touch, sight and sound to enhance their reading and learning experience. E-book is also environmentally friendly compared to the paper books, where it helps reduce the paper consumption. Trollope and others^[10] claimed that e-books have several advantages compared to conventional paper textbooks, including portability and being able to incorporate interactive mediums, such as sound and video. Ebied et al.^[11] agreed that using multimedia within e-book, provides an easy access, organization, easy to return to titles and texts in the e-book, besides the capability to load the book on tablets and mobile phones, which makes it much easier to use at anytime and anywhere.

On the other hand, e-book has brought some disadvantages as well. E-book can cause eyestrain, where human eyes will feel tired when looking on the display screen for a long time because the resolution of the display screen is less than the printed books. Another disadvantage is e-book needs power supply. Without power supply or the batteries die, the user will unable to read the e-book. Some of the formats of the e-book are incompatible with the reader, where some of the format can only be read by specific reader like ePub format, which can be viewed by Apple devices.

The dangerous situations or medical emergencies can happen all the time even at home. If people know how to deal with the situation before an assistance like ambulance arrives, it can make any home a safer place, as people can act quickly when any accident occurs at home. It means that the first aid skills can be applied at home. First aid knowledge aims to save people's life. The advantage of having the first aid knowledge is to minimize the effects of illnesses or accidents and give

the instant treatment to the injury.

There are several related existing systems developed. They are a book named “First Aid Manual”, a printed book that endorsed by St Andrew’s First Aid, St John Ambulance and the British Red Cross^[12], a first aid 2D animation video named “First Aid Animation”^[13] and an e-book entitled “First Aid and Management of Minor Injuries”, which is written by Dallimore^[14].

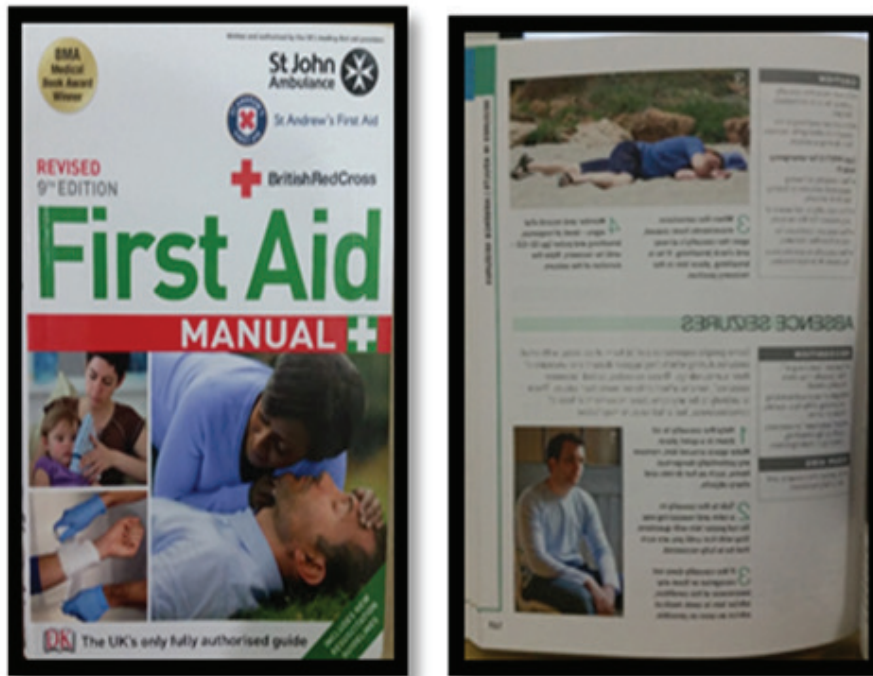


Figure 1: First Aid Manual by St John Ambulance ^[12]

Figure 1 shows the example of how the “First Aid Manual” looks like. It is a printed book that endorsed by St Andrew’s First Aid, St John Ambulance and the British Red Cross, published in 2010. It includes step-by-step first aid advice and used as the official training manual for UKs leading first aid organizations’ courses.



Figure 2: First Aid Animation by xKlaw ^[13]

Figure 2 shows “First Aid Animation” which is a 2D animation video that posted on the YouTube. It is a short animation video that explaining the basics of first aid and the immediate treatment that can be taken.

The video length is 5 minutes and 4 seconds.

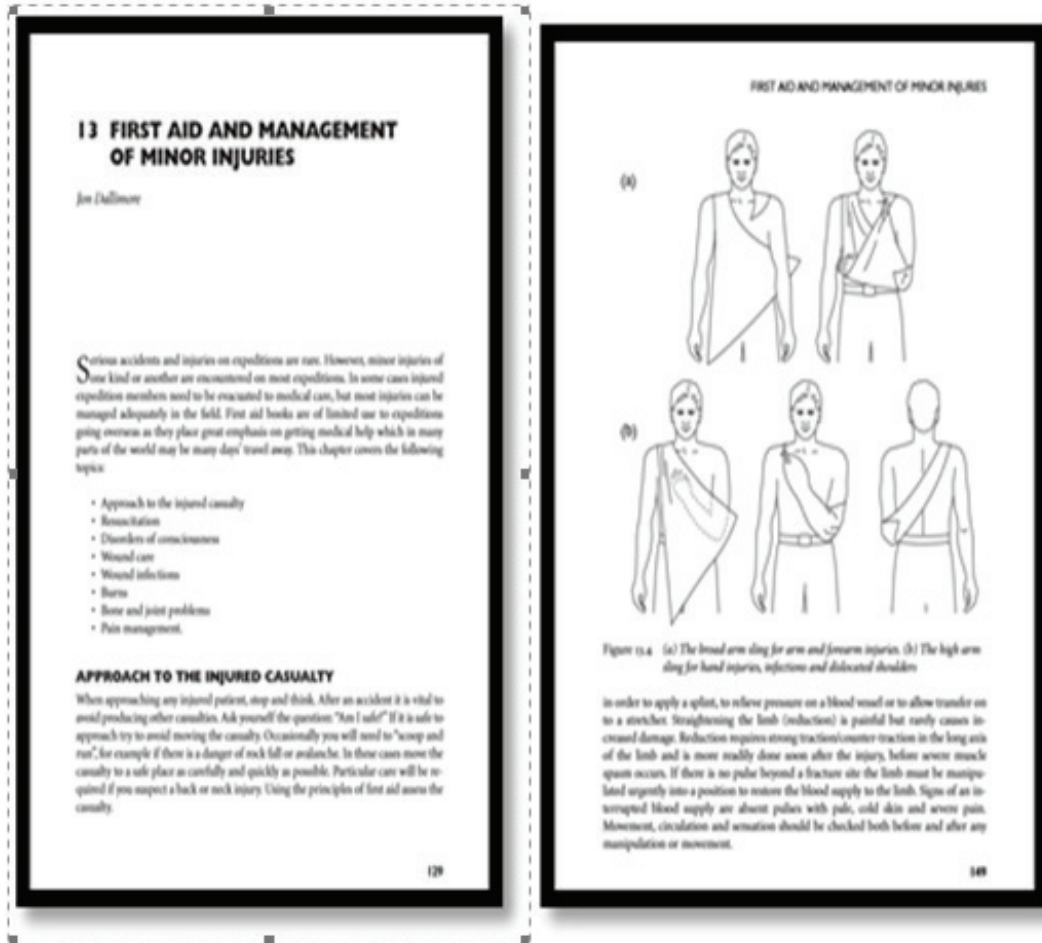


Figure 3: First Aid and Management of Minor Injuries by Jon Dallimore [14]

Figure 3 shows “First Aid and Management of Minor Injuries”, which is a pdf format e-book written by Jon Dallimore. This e-book explains about the minor injuries and its treatment that can be used. It is able to be read by the reader in Windows.

Methodology

The requirement analysis is crucial to the success of a development project. In this section, all requirement will be further analyzed in detail.

Data Collection/Information Requirement

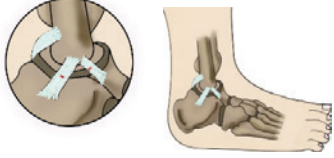



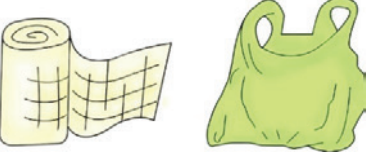
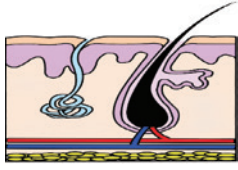


The data was collected through the interview session with the medical doctors at the Universiti Teknikal Malaysia Melaka (UTeM) Health Centre. There are four modules covered in this project, which are ankle sprain, hot water burn, animal bites and infant choking,

which have been confirmed by the medical doctor at UTeM Health Centre that these four selected modules are among the common accidents occur at home area.

Design

During the design phase, the project is designed to fulfill the requirements that identified in the previous analysis phase. In this phase, the design for the interactive e-book such as the cover, layout, and interactive elements are created. Storyboards also the content and media selection are performed in this phase. All the content assets that are created in the design phase will be assembled in the development phase. Meanwhile, Table 1 shows some of the character profile of models for each module used for this e-book.

Table 1: Model Design

Item/Model	Character
Ankle Sprain	
Ankle	
Bandage	
Animal Bites	
Injured hand	
Sterile and clean pad	
Hot Water Burn	
Gauze and plastic bag	
Skin	
Infant Choking	
Back blows	
Chest thrusts	

The content for each of the element in the e-book is discussed below:

Introduction : Briefly explain the product.

Content/Main Menu : A table of content with hyperlink.

Ankle Sprain, Hot Water Burn, Animal Bite and Infant Choking : Selection of modules.

Definition : Explain what is the meaning of the particular module.

Cause : State the cause that happened in the particular module.

Symptoms : List all the symptoms of the particular module.

Treatment : State the treatment steps of the particular module.

Quiz : Test the user’s knowledge on the particular module.

Development

Text is used to give the information and explanation of each of the modules. The fonts used in this interactive e-book are Hobo Std and Estrangelo Edessa for headers/ titles and contents, respectively. Most of the graphics or images used in this project are in Portable Network Graphics (PNG) format, which offers the ability to preserve transparency for the background. All the images are in 2D form. Those vector images have been drawn and edited by using Adobe Illustrator and Adobe Photoshop.

Meanwhile, the audio is generated by using a Text To Speech (TTS) service^[15]. It has been exported into a MP3 format. The video demonstration for ankle sprain treatment has been edited by using Adobe Premiere Pro. The video duration is about one minute and it is exported in FLV format. The animation in this interactive e-book is created by using Adobe Flash. Quiz is one of the animation for each of the modules. All the animations are exported in SWF format.

The integration process of all the multimedia elements was done by using the Adobe InDesign. The final product was exported as an interactive pdf. Figure 4

shows some interfaces of the product, including the main interface, ankle sprain treatment video demonstration interface and quiz interface.



Figure 4: Interactive e-Book Interfaces

Discussion

The strength of the project is this interactive e-book consists of many multimedia elements, such as video, text, audio, graphic and animation, in addition to interactivity, which can attract the attention of the reader. The interactive e-book can engage with the readers by using buttons and quizzes. Moreover, readers can click on the button to see the further information and also answer the quiz to test the understanding of their knowledge on ankle sprain, hot water burn, animal bites and infant choking after reading the interactive e-book.

Conclusion

This paper covers the concept of development of a novel “First Aid and Home Treatment Interactive e-Book”, starting from analysis to implementation phase. The “First Aid and Home Treatment Interactive e-Book” has been developed for public who are frequently carry out their activities at home area. The readers can gain the general medical information on how to treat the ankle sprain, hot water burn, animal bites and infant choking through an interactive book method. The testing phase will be conducted in order to evaluate the acceptance of the application with the medical practitioners and other target users. The interactive e-book also will contribute to the UTeM Health Centre for future use. All the multimedia elements in the interactive e-book is mainly to help the user enhance their knowledge on how to treat the common injuries.

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Ethical Clearance: Nil

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