

The Development of Go Green Courseware: Save the Forest

Puah Pei Wen, Low Dick Kiee, Koo Qian Yan, and Ruzinoor Che Mat

Abstract- Malaysia has seen the economic growth over the last few decades, with industrial, agriculture and tourism. However, at the same time, they also face lots of environmental problems such like deforestation, land pollution, air pollution, and water pollution. Due to this reasons, there is a need to increase the Malaysians awareness, especially the children on the environmental issues. The objective of this paper is to discuss the development of “Go Green Courseware: Save the forest” with interactive learning to helps the children understand and aware about the environmental issue. The courseware developed by using software such as Adobe Flash CS5, Photoshop, and Autodesk 3Ds max which include all of the multimedia elements. The method on how to develop the courseware also discussed in this paper. The courseware has been proven in increasing the understanding and awareness of the children on the environmental issue, especially how to save the forest.

Index Terms-Forest, pollution, go green, save earth, education, courseware

1 INTRODUCTION

Recently, “go green” concept increased in popularity. However in Malaysia, the concept still not so popular and grab the attention of Malaysians. Based on the survey, there is few similar courseware such as “go green” that targeted the primary school’s student in Malaysia. Most of the current teaching materials are printed and the content is not specific to the environmental issues of Malaysia. Courseware can be defined as an educational material intended as teaching kits for teachers and trainers, or as tutorials for students. Thus, a courseware that targets the children of the primary school in Malaysia is developed in order to increase their awareness on environmental issues. In this project, the children will be taught about the effect of pollution to our forests, and how to save the earth by learning through “go green” courseware. In this project, the children will be taught about the concept of “go green” and the ways to apply “go green” in real life. Pollution effects are indeed many and can be wide-ranging. There is no doubt that excessive levels of pollution are causing a lot of damage to human and animal health, tropical rainforests, as well as the wider environment. Therefore, something needs to be done in order to save our earth such as implementing “go green” concept [1]. Implementing “go green” concept is very important because, all of us only have one planet to live on, so we need to take care of it while we got it, to keep

future generations happy and clean. Therefore, “go green” concept need to be started and implemented to let our children aware and understand the “go green” concept at a very early age. The objective of this paper is to discuss on the development of “Go Green Courseware: Save the forest”.

2 LITERATURE REVIEW

The World wildlife foundation reported that deforestation in the Amazon forest is increasing. Around 17% of the forest has been lost for the past 50 year due to land opening for cattle ranching. This also causes a lot of environmental issues such as the increasing of Greenhouse gas emissions which can make the increasing the amount of carbon dioxide due to the lack of tree. This can make the global temperature rising, increased soil erosion and lead to the higher possibility of landslides [2]. Recycling is a method of protecting the environment by reducing and reuse, also by processing material that would consider trash into a new product. Recycling can bring a lot of benefit in protecting the environment [3]. As the world has a fixed amount of resources, recycling will bring a lot of benefit in protecting the environment [4]. Moreover, the preceding literature suggests that when an environmental issue is perceived important, compliance with messages supporting this issues is more likely in general. Ann Kronrod, Amir Grinstein, & Wathieu [5] stated that “Our key idea is that perceived issue importance is also affecting linguistic expectations. Assertiveness may support notions of perceived urgency and mission which issue importance entails.” Some of the researchers also focus on how to encourage the kids toward “go green” concept. Fauth [6] has introduced five ways to grab children attention long enough to teach them a “go green” lesson. The five ways are read, recycling competition, recycling the toys and clothes,

- Puah Pei Wen is with the School of Multimedia Technology & Communication, Universiti Utara Malaysia, Malaysia, Kedah 06010. E-mail: wen@uum.edu.my
- Low Dick Kiee is with the School of Multimedia Technology & Communication, Universiti Utara Malaysia, Malaysia, Kedah 06010. E-mail: dickielow@hotmail.com
- Koo Qian Yan is with the School of Multimedia Technology & Communication, Universiti Utara Malaysia, Malaysia, Kedah 06010. E-mail: qyan3412@gmail.com.
- Ruzinoor Che Mat is with the School of Multimedia Technology & Communication, Universiti Utara Malaysia, Malaysia, Kedah 06010. E-mail: ruzinoor@uum.edu.my.

helps preserve farming as a livelihood, and upcycle recyclables. Besides that, Stuart [7] mentioned that there are many simple tasks which parents can appoint to their children to involve them in the going green process for helping the environment. The tasks are reusing resources, recycling resources, save water, conserving energy and natural resources, and get the kids involved in a fun community service activity. Besides that, Rodriguez [8] stressed that they are five importance thing why the children need to involve in "go green" activity which are our future is here, the everyday benefits, future visions, future opportunities, and finance.

Khedif, Engkamat, & Jack [9] in their research found that the respondents satisfied with the multimedia elements and design of a courseware as it helps the users in learning of the topic better compared to conventional teaching and learning method. They also mentioned that the element of animations in the courseware provided attractive, clear and suitable graphical image, which helps the respondents to understand the topic. The impact of interactive learning materials is very important to improve the learning skills. The method introduced by Islam, Ahmed, Islam, & Shamsuddin [10] showing that the improvement of students learning skills especially when it's being used as the main resources by the teacher. This method introduces for promoting learning and quick adaptation with learning materials [10]. Nusir, Alsmadi, Al-Kabi, & Shardqah [11] found that the alternative for traditional education can be offer by multimedia education. It's can enhance the current teaching methods by providing alternative way especially when teaching in educational methods is not applicable. It's also mentioned that in assisting students learning process, interactive learning can play an important role. While Bird & Edwards [12] introduce the framework on a digital play for children learning to use technologies through play. The framework suggested that one way of understanding how children learn to use technologies is through play. It also provides teachers with guidance on how to integrate technologies with play-based learning. Other than that, Schulz [13] mentioned that children's learning processes are also present from a particular task to adults. He also mentioned that to promote and to accompany children's learning everywhere and at all times, its need to be called.

3 THE DEVELOPMENT METHODOLOGY

The development of Go Green Courseware: Save the forest involved five majors stage as it follows waterfall software development life cycle. The process begins with the requirement analysis, system design, implementation, testing, and maintenance. The courseware was developed based on multimedia elements included such as video, audio, animation, graphics and image to become more attractive and alive. The software's used in the development consist of Adobe Photoshop CS5, Adobe Flash CS5, Adobe Illustrator CS5, Adobe Premiere Pro CS5 and Audacity. Figure 1 shows how each phase of the

development is conducted.

3.1 Requirement Analysis

A suitable title for the project was chosen and the objective, problem statement, project background, scope were identified. The title of this project was "go green", which aims to inculcate the importance of the environment to children and encourage them to apply it in real life. The schedule for the project was planned as well. All possible requirements of the courseware to be developed were captured in this phase and documented in a requirement specification document. A survey was conducted during this phase in order to know the requirements of the user towards educational courseware. The sample size of respondents were 20 children of primary school (7-12years old) in Changlun.

3.2 System Design

The requirement specifications from the first phase were studied in this phase and system design was prepared. System design helped in specifying hardware and system requirements and also helped in defining overall system architecture. This project focus on the environment's issue about forest. Audio, video, game and exercise that related to the topic were embedded in order to make the teaching's process more interesting and impressed. Besides that the layout of modules, low fidelity prototype and storyboard were prepared. For low fidelity prototype, the layout and function of the courseware were designed. Then, Adobe Photoshop and Adobe



Fig. 1. Phase of Waterfall Methodology.

Illustrator are used to design the interface and combined it by using Adobe Flash. Then the file were exported into a simple SWF file.

metaphor in order to enhance the usability of courseware.

3.3 Implementation

A prototype was developed by following the system design phase. The alteration was made based on information from multiple sources. For examples, online journals, articles, news, and organization like World Wildlife Fund (WWF). The interface, characters, contents, background image and buttons for the courseware were redesigned in order to make it more consistent. This phase also includes programming for unit/module such as a game.

3.4 Testing

All the units developed in the implementation phase were integrated into a system after testing of each unit. All the unit is combined such as the unit of Learning, Exercise, and Game in into one courseware and made it functional. Sound effects and music were added into the courseware as well. Then, post integration the entire system was tested for any faults and failures. Once the functional and non-functional testing was done, expert evaluation was conducted to utilize the knowledge of user experience professionals in evaluating the effectiveness of the courseware. As well as, the feedback of the weakness and acceptance of courseware can be identified before tested by target users. The errors were fixed, based on the suggestion from experts and users' evaluation, user's evaluation was conducted to know the general acceptance of user on the use of courseware as well as statistics on users' opinions about interface and retrieval features. The result from the user evaluation shows that most of the children were able to understand the message delivered by courseware more quickly.

3.5 Maintenance

If there were some issues arises in the client environment, those issues were fixed and the product were improved with better functions and performances. Maintenance was done to deliver these changes in the user environment. For example, more instruction were given to the user as a guide and the buttons were corrected by using suitable

3 THE GO GREEN COURSEWARE: SAVE THE FOREST



Fig. 2. Main interface

The "Go Green Courseware: Save the forest" is developed to elaborate the importance of protecting the environment issue for children. It's utilized SWF file format capability to create interactivity as this can attract the children attention and indirectly learn about protecting the environment and applied what the children have to learn from this courseware into real life. This courseware contains three main parts which are "Learn", "Quiz" and "Game" (refer Figure 2). All of the parts were created in colourful and interactive styles to attract our target audience which are children between 7 to 12 years. In the "Learn" part, it contains the four phases which are "Important of forest" (refer Figure 3), "Cause of deforestation" (refer Figure 4), "Effects of deforestation" (refer Figure 5) and "Solution to save the forest". Thus, users will learn the knowledge based on these information.



Fig. 4. Cause of deforestation interface.



Fig. 5. Phase of Waterfall Methodology.



Fig. 7. Easy level of Quiz interface.

While, for the "Quiz" (refer Figure 6) part, it was distinguished into three different levels which are "Easy" for level 1 (refer Figure 7), "Medium" for level 2 (refer Figure 8) and "Hard" for level 3 (refer Figure 9). These three different levels are construct based on the level of the difficulty. The "Easy" level are only asking the children to choose the answer from the pictures. While the "Medium" level, the children need to choose the answer from two multiple choice questions. Finally, in the "Hard" level, the children need to choose the answer from three multiple choice questions. In order to answer all of the questions correctly, the children need to go through the "Learn" part thoroughly. This is because, the answer for all of the question is based on the "Learn" part.



Fig. 6. Quiz interface.



Fig. 9. Hard level of Quiz interface.

Furthermore, for the “Game” section (refer Figure 10), it’s divided into three different types of games which are “the rubbish challenge” (refer Figure 11), “save the tree” (refer Figure 12), and “seed bird” (refer Figure 13). From “the rubbish challenge” game, the children can understand how to manage the rubbish by disposed it into the correct recycle bin. While, by playing the “save the tree” game, its test the children on how to save the tree from being demolished by the illegal loggers. Finally, by playing the



Fig. 10. Game interface.



Fig. 11. Rubbish challenge interface.



Fig. 12. Save the tree interface.



Fig. 13. Seed bird interface.

“seed bird” game, the children exposed to the challenge on how to save the seed and plant it in the safe place.

4 CONCLUSION

The development of “Go Green Courseware: Save the Forest” has been elaborated and discussed details in this paper. This courseware developed to help especially the children on the environmental issues. The issue that highlight in the applications is related to save the forest. The courseware utilizes all of the multimedia elements such as text, graphics, video, and audio to make it more interactive learning. With the interactive learning, it’s can be a good platform to teach the children on an environmental issue. The courseware develops by using some software such as Adobe Flash CS5, Photoshop, and Autodesk 3Ds max. The authors hoped that this courseware can be used by all of the children (7-12 years) as their important tools for understanding how to be a “go green” and save the forest. This can increase their awareness on environmental issue toward saving the earth for the healthy life. The future direction of this courseware is that the new version of courseware with extra functions, languages and modules could be developed in the future for the benefit of the user. With the new functions and more modules develop in the new courseware, it can encourage more users in the community to use this courseware and bring more benefits to the society.

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Puah Pei Wen obtained his Bachelor of Science degree with honours in Multimedia from School of Multimedia Technology and Communication, Universiti Utara Malaysia. Currently doing her internship in the company. Her research interests more on multimedia technology.



Low Dick Kiee obtained his Bachelor of Science degree with honours in Multimedia from School of Multimedia Technology and Communication, Universiti Utara Malaysia. Currently doing her internship in the company. Her research interests more on multimedia technology.



Khoo Qian Yan obtained his Bachelor of Science degree with honours in Multimedia from School of Multimedia Technology and Communication, University Utara Malaysia. Currently doing her internship in the company. Her research interests more on multimedia technology.



Ruzinoor Che Mat is a Senior Lecturer at the School of Multimedia Technology and Communication, Universiti Utara Malaysia and currently Deputy Director of Professional and Continuing Education Center (PACE) UUM. His research areas include reverse engineering, 3D GIS, terrain visualization, remote sensing application, virtual reality, computer graphics and visualization. He received Diploma in Electronic Engineering (Computer) from Politeknik Ungku Omar, Ipoh Perak, BEng (Hons.) Electrical and Electronic Engineering from Coventry University, UK, MSc. Computer Graphics and Virtual Environment from University of Hull, UK and PhD in GIS and Geomatic Engineering from Universiti Putra Malaysia.