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INTERACTIVE MULTIMEDIA DESIGN AND APPLICATION IN SOCIALIZING SUSTAINABLE ENVIRONMENT FOR TEENS

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Abstract

This research aims to produce an interactive multimedia as an attempt to bring the information of the sustainable environment concept for teens. The concept of sustainable environment is one important basis in environment conservation. The information presented in this interactive multimedia focused on sustainability concept applied to the behavior in everyday life as well as various exposures to environmental problems caused by unsustainable behavior. The content material presented includes energy, water and waste management. The research was conducted using the Research and Development (R & D) approach. This research is producing an interactive multimedia application accompanied by the the concept of media strategy application, which was developed through the stage of preliminary studies phase followed by evaluation stage.

Keywords: environment, sustainability, interactive multimedia, teens

1. Introduction

The concept of sustainable environment is a concept to reach the balance of the environment elements so that environmental sustainability can last for a long period. Concern about sustainability means to accept responsibility for the well-being of future generations. This concept needs understanding and awareness of the dangers and threats of environmental damage due to the paradigm that environmental and natural resources as a land to be conquered by human exploitation. An affirmative attitude towards sustainability has to be an integral part of the moral foundation of our activities and lifestyle. This means that promoting sustainability must be an important aspect of the educational agenda at all levels, especially for youth. Based on the Sustainability Education Summit held in Johanesburg in 2002, UNESCO was to accelerate reforms of education and coordinate the activities of all stakeholders in education through a wide-ranging Work Program. Some objectives of the Work Program were to educate and to promote sustainable consumption and production patterns in all countries and raise public awareness. Therefore education and outreach efforts related to the threat of the unbalanced environmental conditions and procedures to prevent environment degradation should be performed as soon as possible. New policies, programmes, resources and activities can be reported from almost every country, a sure and encouraging sign that education and socialization are beginning to be seen as

a significant aspect of global sustainability issues. This research focus to teens because they are potential to think critically and can be agent of change to create a better environment in the future.

Based on preliminary study conducted through observation and result analysis of questionnaires known that most of the respondents aware of the existence of environmental preservation movements and organizations in local or global scope. But, only a few of them who already involved and take part of the environmental preservation movements. Discussion and education sometimes can not reach the basic understanding of the young people. Media is needed to make this sustainable issue can be easily understandable for them.

The advantages of interactive multimedia compared to other media is perpetuation of memory. The use of multimedia in industries has been extensive, as it has been effective in increasing productivity and retention rates, where research has shown that people remember 20% of what they see, 40% of what they see and hear, but about 75% of what they see and hear and do simultaneously (Lindstorm, 1994). Interactive multimedia is a media to convey the message that has those three criteria. Interactive multimedia play activity is one form of constructivism-based learning that emphasizes learner as a major figure in the learning process.

2. Methods And Procedures

This research and design of simulation interactive multimedia with sustainable environment theme is using stage model of Borg and Gall (1989:783-795), which consists of seven steps as follows :

1. Preliminary Study, the first step includes need assessment analysis, literature review and literature research related to environmental problems that occur in sub urban areas in Indonesia.
2. Research Planning, start from setting the research objectives, estimates of funds, manpower and time, and researchers qualification and their participation in the study.
3. Design Development, planning the concept of interactive multimedia design, interactive multimedia design results as a hypothetical design, determine the facilities and infrastructure needed in research, determining the stages of design development and determining the job description of the parties involved in the research.
4. Preliminary Field Test is a limited product test with the initial field test for the product design and is done twice.
5. Revision of Limited Field Test Results is an improvement or design or models based on limited field test. Most are performed with a qualitative approach. Evaluation is mostly performed on the evaluation of the process, so that the improvements made are internal improvements.
6. Main Field Test is a wider test product by using experimental techniques repetition models.
7. Final Revision of Eligibility Test Result is product perfection for the developed product accuracy with a level of effectiveness that can be justified. The result of this stage is an interactive multimedia product that is ready to be published both offline and online.

In outline, the design stages of this interactive multimedia model consist of:

1) The concept of interactive multimedia design. Initial draft which includes aspects of interactive multimedia design, narrative, timeline and budgeting.
2) Preparation of visual assets. Preparing assets visual interactive multimedia which includes asset of building, environment, people, animals and vehicles.
3) Programming. Making the code required to build a digital application (engine).
4) Testing. Interactive multimedia application performance testing to avoid errors (bugs) and to test whether interactive multimedia works well or not.
5) Publishing. Making interactive multimedia applications into a ready-to-use products and ready to be distributed.

3. Result

3.1. Design Concept Development

1) The concept of Discourse Competence

   The resulting interactive multimedia refers to how adolescents understand the concept of sustainability and to link it with the real conditions occurring around the neighborhood where they live. Thus the topic of sustainability is communicated interactively as well as various examples of environmental problems that appear involved in the social context of sub-urban areas.

2) The concept of communication.

   In terms of demographics, the primary goal of interactive multimedia communications are adolescents with age range between 13-15 years. Therefore both narrative and visualization developed character always rests on teenage characters.

   Judging from the geographical aspect, the primary goal of interactive multimedia communications are adolescents in sub-urban areas which have computer facilities both at school and at home. But this interactive multimedia can be disseminated to a broader scope of geographical area regarding that computer is a device that belongs to each school or personal .

   Teens as the target of this communications media are teenagers who can operate the computer, especially for students who are familiar with computer games. Almost all teenagers now make the computer as an important part of their daily lives. Thus, this interactive multimedia is a potential media as an alternative that can entertain as well as increase the students ability and knowledge to understand the concept of sustainable environment .

3.2. Concept Of Interactive Multimedia

In this interactive multimedia, there are two main types of activities. The main activity is the elaboration of a variety of important information to create an environment which refers to the concept of sustainability. The topics of discussion include energy savings, water use and waste management. Information on the three elements were presented in the form of narrative -based audio that will be supported with an explanation in the form of animation.

The second activity is an activity to measure the knowledge of the target audience related to sustainable environment issues. In this activity, the user will be presented with several interactive multimedia environmental issues and asked to choose the most prudent action decisions in dealing with the environmental problems. Any decision or action taken had levels of effectiveness that will be demonstrated through sustainability meter, and the results can be seen through sustainability charter in virtual form, but can also be printed. The Charter is a reward / recognition of user effort in understanding the concept of sustainability.

3.3. Character Development

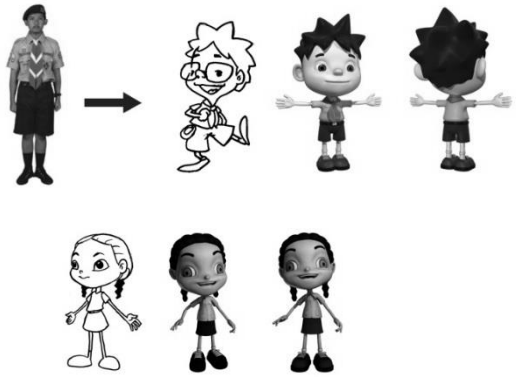

Figure 1. The main characters in interactive multimedia with scout uniform

Based on the target users of this interactive determined that the character used refers to the social symbols displayed by the students including the physical form and attributes imposed. From attributes applied scout uniform is still in use by all junior high school students on Friday and Saturday. Of these reasons, the characters in interactive multimedia are designed to wear scout, so it can represent junior high school students in all levels. Design development is done with styling cartoon character so that the character does not seem too realistic, but it has a simple and attractive impression. The overall design of the characters contained in this interactive multimedia was developed with pre-rendered techniques of 3-dimensional objects into two-dimensional sprite, so users can view the media each character from various sides.

3.4. Interactive Multimedia Interfaces

This interactive multimedia preceded by a pre-loader that displays the identity of some of those involved in the development of this interactive multimedia. After the preloader page appears, followed by the main menu interface where there are two main characters named Tito and Nasya who greets the audience and briefly describe the content of the interactive multimedia.

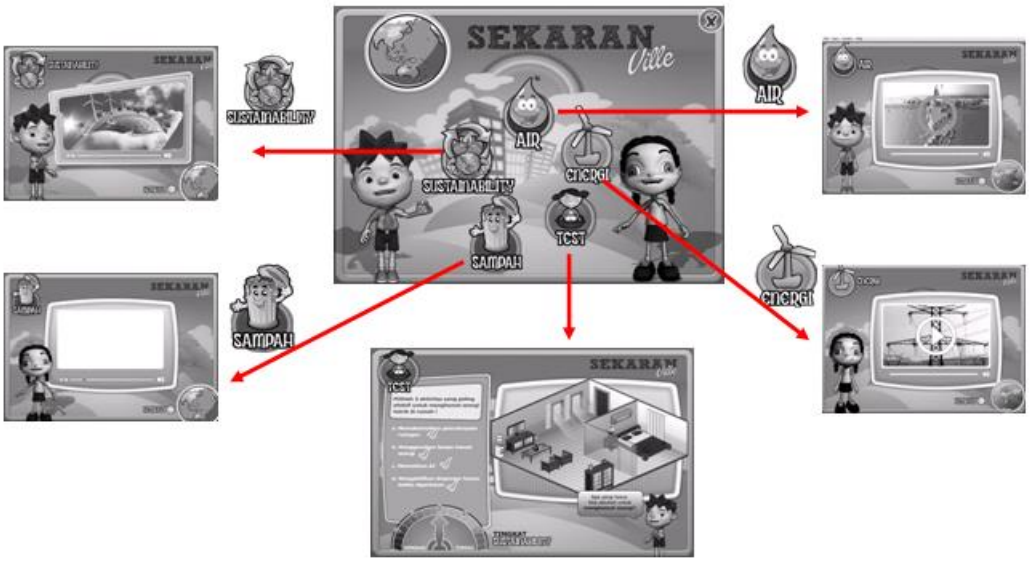

Figure 2. The main menu of interactive multimedia display

In the main view, there are 5 buttons that will connect the audience to a different interface. Sustainability button will connect audience to the sustainability menu that contains all the information about the concept of sustainability, impact of not implementing sustainability behavior, and the steps to be able to create a more sustainable environment. All information is packaged in a format that is supported by audio narration animated character to explain through video display. Video display can be controlled by using the play and pause buttons are found on the video bar, as well as volume control.

The energy button connects the audience to energy menu that contains information about type of energy used by the majority of people on earth. Through an animated display of characters supported by video, described how the impact of burning fossil fuel energy results for the sustainability of life on earth. Water button connects the audience with water menu which contains information about how the condition of groundwater in wells as the source of clean water in sub-urban areas is strongly influenced by environmental conditions. This menu also guides the audience to know the simple steps that can be done to conserve water and protect water quality in the neighborhood. Waste button will connect the audience on the menu that explains how to manage waste in our neighborhood. This menu also discussed the 3 R program namely Reduce, Reuse and Recycle that can be associated with activities of daily living.

In the test menu, the audience will be asked to decide the most sustainable actions related to energy use, water and waste management. The results of this test is in the form of charters that can be printed as a reward /awards for the audience to learn the concept of sustainability, an initial step to create a better living environment.

3.5 Interactive Multimedia Quality

First trial phase is the activity carried out on a limited scale in focus group discussion. This activity is intended to assess the interactive multimedia prototype that has been developed with the involvement of some respondents who have sufficient knowledge and competence in the field of interactive multimedia. In this activity respondents were required to evaluate the quality of the prototype by rating the visual interface design, information content and usability.

Roughly half of the respondents (54%, 13 of 24) assess good for visual interface design (contains of visual literacy, character design, composition). The information content presented is quite good, most respondents (62,5%, 15 of 24) asses that the interactive multimedia is still lack of concise in delivery strategy because the duration of the narration and the video considered too long. While the use of interactive multimedia accessibility is considered good by most respondents (75%, 18 of 24) as ease for running interactive multimedia applications in various type of device.

Interviews and focus group discussions were also conducted to evaluate and explore the expectations of the respondents in interactive multimedia development before the media is being tested to target audiences with a broader scope. The findings and discussions have been focused to the strategy media of interactive multimedia applications. Considering behaviorist and psychographic aspects of teenagers as the main target audience, the strategies for choosing the right media to run this interactive multimedia application must be considered thoroughly. Internet is a computer network connected globally and spread throughout the world. Network of millions of computers allows a wide range of applications implemented between computers through the internet to support the software and hardware required. The rapid development of the internet is used by most teen to facilitate the required information searching. Most respondents in the focus group suggested to run interactive multimedia developed as an application through a web browser. By providing specialized domain that accommodates the theme of sustainable environment, the application developed can be a supporting media to promote the concept of sustainability. To maximize the persuasive aspect, it would be ideal if there are organizations that work together to manage this domain and encourage an environmental campaign that encourages teen to be involved and participate in the rescue environment program.

3.6 Design Revision

The next step after the implementation of the Focus Group Discussion is to revise the interactive multimedia developed. The first stage of the design revision activities focused on improving narrative and audio quality. Based on the suggestions given by the respondents in Focus Group Discussion, previous video narration that lasted two minutes was condensed into one minute without reducing the clarity of the content.

The selection of the right media strategy is the use of the internet so that the media can be accessed through a web browser and used on a broad scale. One website named www.pedulibumi.com then used as a means to run this interactive multimedia. Along with the

process of website development and content refinement, interactive multimedia development also through some tests to ensure that this application can be run through the browser fluently.

3.7 Main Field Test

First phase in design revision produced an interactive multimedia that has been refined. This media was then tested on 164 respondents aged 11-13 years from three different junior high schools. Before the implementation of the interactive multimedia test, students are given pre-test containing 10 questions related to the understanding and knowledge of sustainability concept. From the test results concluded that the media use of interactive multimedia as a media to socialize sustainable environment concept is quite effective. It can be seen from the average pre-test score of 67.05 increased to 72.12 during the post-test.

Through unstructured interviews conducted, 49% respondents agreed that the use of interactive multimedia can help them to improve a better understanding in sustainable environment concept and also motivate them to take part more in sustainability and environmental preservation activities. In line with the respondents in FGD sugesstion, respondents also suggested that the interactive multimedia can be accessed online, through a web browser or serve as an application that can be downloaded via smartphones. With the ease of Internet access, it is expected that this media can be run online so that more audiences can access it.

4.Conclusion

In developing an interactive multimedia that can be a media of socialization and education of sustainable environment concept for teens, it is required a relevant data relating to the condition and the character of the area, object behavior, environmental issues and the characteristics of the waste that occurs in the closest area in our environment. The information in interactive multimedia also contains numerous examples of simple behaviors that can transform the neighborhood into a more sustainable environment. Overall information presented in narrative form supported by the main display and video animation character. The challenge to educate society about sustainable environment is quite complex, because it is requiring partnerships among governments, academic and scientific communities, teachers, non-governmental organizations (NGOs), local communities and the media. All elements are essential to the birth of a culture of sustainability.

References

[1] Bog Dan, Robert, S. & Biklen N. **Qualitiative Research for Education: An Introduction to Theory and Methods**, Allyn and Bacon, Boston (1982)
[2] Cato, Scott. **Green Economics,** Earthscan, London (2009)

[3] Aan, Munawar Syamsudin. **Metode Riset Kuantitatif Komunikasi,** Pustaka Pelajar, Yogyakarta (2013)
[4] Lindstrom, R. **The Business Week Guide to Multimedia Presentations: Create Dynamic Presentations That Inspire**, McGraw-Hill, New York: (1994).