THE USING OF VERNACULAR DESIGN TO DEVELOP EDUCATIONAL MEDIA FOR DISASTER MITIGATION THE DIRECTION OF DISASTER MITIGATION STRATEGIES IN THE RING OF FIRE REGION

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Abstract: Indonesia located in the intersection zone of Eurasian Plate, Pacific Ocean Plate and Indo-Australia causing some areas in Indonesia has the potential to experience periodically both earthquakes and tsunami. The education to deal with those circumstances has become a necessity in most parts of Indonesia to build resilience to disaster. This research aims to identify, understand and explain the study of visual content on disaster education media in the strategy of vernacular design. This difference emerges because of the authority of traditional knowledge and the stakeholder of local wisdom which is widely followed by several communities in Indonesian society has different direction in seeing disasters. Educational media that have been developed utilize the spoken culture such as folksongs, folktale or traditional games, but it's never been evaluated the effectiveness of the media in term of visual communication approach. Technological developments close to the user allow opportunities to take a role in disaster and mitigation education. Educational media for disaster mitigation that has been used to provide understanding to the community has been widely disseminated. It is necessary to explore the formal aesthetics of educational content design on disaster mitigation as a disaster education effort through various possibilities in communication approach through vernacular visual language in disaster education. The research method use ethnography with qualitative descriptive analysis. The results of the research will be used as recommendation to the stakeholders and designers as design guideline that consider the site specific factor of each disaster characteristic.

Keywords: *disaster mitigation, educational media, local wisdom, vernacular design*

BACKGROUND

Educational media for disaster mitigation that has been used to provide understanding to the community has been widely disseminated, both by the government and disaster-related institutions. Some areas in the ring of fire have traditional, vernacular patterns of mitigation that are passed on for generations and are not always consistent with modern disaster management (Lakoro,et.al.,2018). In traditional perspective, disaster mostly related to certain group beliefs in dealing with the cultural act to avoid danger. The ring area of fire that passed through Indonesia Archipelago has a different cultural colour and can be explored the incompatibility of a media in approaching a social system. According to Dale's cone of experience (1946), disaster simulation and drill found effective, it costs big enough to replicate exactly, and also have problem with human resources that conduct the simulation. Simulation and drill methods also need supporting infrastructure and time consuming in preparation and evaluation. Educational media could be a good bridging to the problems. Although media also have communication issues but plan and implementation strategy could reduce the gap between message and audiences.

This study attempt to evaluate the media used in disaster mitigation education with the characteristics of print media with media that generally uses paper and is distributed both indoors and outdoors. The media can be printed media or compiled information in the form of books or booklets. Theoretically, the review on the print media can be done using mass communication theories aimed at

educational purposes, campaigns and propaganda, including theories of symbolic activity, the theory of mass communication and communication in the community (Wood, 2004: 89-236).

LITERATURE REVIEW

Previous research conducted to the educational media of disaster mitigation were highlighted the multicultural problem and attempt to develop media based on those differences using game model (Cleveraux, Spence, Katada, 2008); An integrated curriculum to help the teacher in teaching using virtual technology to support this process. (Mantasia, Hendra Jaya, 2016); analyzing the level of visual literacy ability of the people that has no awareness of the dangers of natural disasters with case studies on tsunami (Danang Febriyantoko, Naomi Haswanto, Y. Martinus P., 2012); Lenni Kartika Indah, Bambang Triatmodjo, Radianta Triatmadja (2008) found that the system that has been running so far has been ineffective. Mugeni Sugiharto, Oktarina (2015) Education has had the expected impact. The community has wanted to evacuate as a result of disaster preparedness training. Focus on evacuation and rescue procedures and counseling needs to be sustainable so that community preparedness becomes sustainable. Miftakhul Huda (2013) found that 49.5% of students in Klaten have lack understanding of earthquake disaster mitigation. The teacher gives earthquake material but understanding of mitigation is not conveyed to students. Lunenfeld (in Laurel, 2003: 13) reveals the paradigm in design as research, that the feasibility of testing and reproduction in design research is not more important than its sensitivity to the social context and cultural moments that make the results of the design research resonate with the public or market. This is in line with the opinion of Laurel (2003: 17) that human-centred design research can strengthen the ability of designers to form popular culture and subtly transmit values through design. This is important for designers who want to show their good side in transforming consciousness from conditioned responses to active participation. The everyday language through which a group, community or region communicates is its vernacular. It is recurrent aspect within graphic design as designers draw on vernacular by incorporating found items, such as street signs and borrowing low-culture forms of communication, such as slang. Ambrose and Harris (2009:70) offer several techniques to develop vernacular design by found objects, placement, appropriation and irony. They also use semiotics approach as the study signs that offer an explanation of how people extract meaning from words, sounds, pictures. An understanding of semiotics helps a designer to instil works with references that enable them to communicate multiple layers of information to a reader.

METHOD

The method of this research is qualitative approach with user experience research tools. The tools used in this research are usability testing and contextual inquiry. Usability testing used to have an understanding of user's needs of each product or media. Contextual inquiry used to observe in the context where the user interact with the media. The populations of research are people that live in the area with disaster potential. The study conducted to educational media that using as tools for disaster mitigation. The media characteristic issued by BNPB (The National Agency for Disaster Countermeasure) and BPBD (The Regional Agency for Disaster Countermeasure) with mass communication intended. The instruments for this research are educational media in any modality such as posters, videos, animations, games that related to disaster education. Observed design variables are related to design composition and layout, the use of color, text and illustration, also sound for screen-based media. Observed contents are the messages that convey onto media with specific delivery technique. Interviews and group discussions also conducted to search the perspective of best practice in educational media that have been used to inform about disaster risk reduction (DRR).

RESULTS AND DISCUSSION

Table 1 shows the user interface of application for smartphone that provided by BNPB to inform disaster to public with both static and dynamic data. User could access the common knowledge of disaster, and also the event of disaster in the map in Indonesia Archipelago. As the users of smartphone increase, application design would be the significant media to convey, promote, warn and educate the public about disaster. It needs further research about content creation and the integration to the early warning system. The using of long text in most content indicates that this media require user with high communication context to understand the message.

Table 1. Educational Media Analysis of Sample 1: disaster information apps

Media	Design Variable	Content
 Disaster Information apps issued by BNPB (The National Agency for Disaster Countermeasure)	**Composition** uses the vertical composition with 1 and 2 columns grids. The 2 columns grids used to arrange the icons vertically aligned and maintain the size of proper readability **Colors** using bright color of background and black text as contrast. The colors of the icons mostly using red constantly as the sign of alertness. In this version the header and contents not separated by color distinctively **Text** typography palette using the universal typeface that using in smartphone operating system from sans serif type with clarity if use in proper size. **Illustrations** using icon designed as a logo that describe the content and sub content, but the potential to explain the text with illustration haven't optimized **No sounds code** interaction could be more intensive to create connection between user and the content they desired to access	**Disaster information** represent by icons of disasters use the basic shape that associate with content. The icon also applied on the map that shows the level of disaster by using the color tones. Most content are written in Indonesian language with long text and highly context that needs reader with more intellectual capacity. The content also indicate the users of this application would be young to mature user with requirement at high school education level **Disaster diagrams** are displayed in several panels to make it easier for the audience to understand the level of threat using red, yellow and green color as indicator.

Table 2 shows information poster that explain the disaster briefly using text and image, the samples taken from BPBD Yogyakarta Special Region.

Table 2. Educational Media Analysis of Sample 1: disaster information poster

Media	Design Variable	Content
	Composition uses the composition with 2 columns with images inserted between the text to explain the context **Colors** use high contrast palette with dark colors as background and white as text color and another bright color to emphasize the topic **Text** typography palette using the universal typeface from sans serif type with clarity for body text and sub headlines. For the headline, it use typeface with special treatment to create effect of collapsing building. The text size only effective to read from the	**Disaster information** describe the symptoms of earthquake, what to do in different situation and environment. The illustration emphasize and also redundant with the text. As basic information about earthquake, this poster is useful, but it has to distribute in the right target and community. To educate people to react as the poster informed, it needs further explanation, exercise or simulation.

 Disaster Information poster issued by BPBD (The Regional Agency for Disaster Countermeasure) of Special Region Yogyakarta	distance about 2-4 meters **Illustrations** using vector drawing with opaque colors with different styles of proportion to illustrate the character. For the background it used digital editing of photography with adjusting the contrast and color value. It's vernacular style used to grab attention from young reader **Printed material in A2 size**	

Table 3 shows the video that using graphic recorder technique that collaborate drawing and narration to create meaningful understanding.

Table 3. Educational Media Analysis of Sample 1: disaster educational video

Media	Design Variable	Content
 Launched at 2014 by BNPB (3,445 views at September 2018) and Impro-Visual Storyteller (1,885 views at September 2018)	**Composition** uses the composition rules in the comic panels with emphasis on some enlarged panels with the close up and *followthrough* camera technique. **Colors** use only white board with black marker as the main color of illustration. **Text** handwritten typography used to build vernacular feeling of this presentation with the interaction of the illustrator's hand to erase and re-write information following the narration **Illustrations** using cartoony and caricatural styles that draw lively with adjustment in speed in which the information priority are emphasized. It's vernacular style used to grab attention from young reader **Sounds code** using narration as main authorities in this video, and music as background sound to maintain the attention of audience. It also used sound effects to emphasize the graphic recorder illustration process.	**Character design** aimed to elementary and high school with attractive style. The character also adopted from the common model of student, so the communication build with integration technique that make communicator and audience are in the same side. **Process diagrams** are displayed following the narration and finally create the big picture of the topic. It starts from background problem and details, and finally comes up with awareness and disaster mitigation. The distinctive technique of graphic recorder could be used consistently as campaign identity in wider context, like awareness campaign.

For the comparison, table 4 shows media that simulate the mitigation using game scenario. The media could download freely in application store and provide some scenarios of disaster that encourage user to overcome with the problem they met in game.

Table 4. Educational Media Analysis of Sample 1: disaster simulation game

Media	Design Variable	Content
    Geostorm, game screenshoot issued by Sticky Studio, Skydance and Warner Bros (2017). It has 1 million downloads with 4,3 star rating by 23,715 users at Sept.2018	**Composition** uses the composition rules in the screen-based design with horizontal/ landscape orientation. This layout works like camera composition, but in game screen, it used 3d semi-isometric view to present the main stage of the game. This view enables user to play as omnipresent player in the whole screen area. **Colors** use darker color value but with pastel palette color. It also applied vignette in each frame to create the senses of awareness and crisis. This palette could be a response to game scenario that simulates a global catastrophy **Text** typography palette using the universal typeface that using in smartphone operating system from sans serif type with clarity if use in proper size. Mostly in bright white color and left the game title in red with big size. **Illustrations** using 3D character and environment with contrast. The walkthrough scenario simulates the place with common facility like office or public space. It also simulate the safety-related facility like electricity panel, fire extinguisher etc. to build the likeness with actual environment. **Sounds code** using actual sounds as response of interaction like folley sounds of door switch, water drop etc, and music as background sound to maintain the attention of audience. It also used sound effects to emphasize the scenario turn	**Character design** aimed high school student which are familiar with this game genre and scenario. Player could have different character in different scenario with basic ability like walking, runnig, interact with objects, swimming, climbing and jumping **Evacuation Process** are the main scenario of this game to take action during disaster in our environment. It simulates how to find the way safely during the catastrophic situation like earthquake or fire.

Conclusions

Samples taken in this preliminary study show a diversity of approaches, both visually and verbally. In addition to the language approach used, the target audience that is widely served in education and information disaster is the high-school students with intellectual capacity required to absorb the message. This conclusion is drawn from the vernacular design styles used and the complete information given. In addition, the approach to the audience tends to be dominated by more visual language with colors that are popular among these ages, it means the using of vernacular design could use as alternative as visual approach to the group. The use of animation and or interactive element could engage the audience deeper with the message of disaster mitigation. Posters are not so effective since it depends on the distribution and further explanation to the public. In broad-range of audiences, animation and games are most complete media to provide the information and simulates the disaster as well.

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