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Teenager and Climate Change Communication

Sulistyawati Sulistyawati, Surahma Asti Mulasari, Tri Wahyuni Sukesi

Abstract— Climate change considers as a global issue with some unexpected impact on human being health. The teenager is a promising agent of change to elevate climate change knowledge of the community. However, teenager knowledge on climate change impact is inadequate. Accordingly, developing education media for a teenager is essential to increase climate change awareness. This research aimed to developed and tested media that is Website, Facebook and Instagram to increase teenager knowledge by following 4 out of 10 research and development steps: researching and collecting information, planning, developing of an initial product, preliminary field testing. Research and Development by recruiting Twelve teenagers aged 16-17 years old from 3 high schools in Yogyakarta City were involved in this trial. Instagram was found as promising media to spread climate change impact information to the teenager. Mass media can be used to educate teenager effectively.

Index Terms— Teenagers, Education, Climate change, Internet, Social media.

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1 INTRODUCTION

NOwadays, climate change becomes a global issue [1] not only for developed but also for developing country [2]. However, look at the readiness such as budget resources, developing country seems facing the worst impact of climate change. Accordingly, for instance in Indonesia, the government initiates to increase community readiness or resilience to confront climate change. International Panel of Climate Change (IPCC) defines climate change as a process the changing of the climate that statistically tests in the extended period due to natural caused or as a result of human activity [3]. Meanwhile, this research context is addressing climate change related to the human activity which is a manifestation of CO2 emission in the earth surface that emerging the greenhouse effect [4].

This paper investigates the developing and testing the media for a communicating risk of climate change for elevating the teenager knowledge about climate change impact. The study was performed under the framework that teenager is a promising agent for social change [5] including for climate change risk communication. But, however all the time, a limited media provided by a suitable content of climate change in particular for the teenager.

This study is part of a bigger project aimed at increasing climate change awareness in the Indonesia community through teenager engagement as a message carrier. According to [5], engaging teenager means that sitting together with them to observe their needs, desires and how to connect them in our program. In this research, we provided the teenager with familiar media and easy to access, that is internet and social media since nowadays almost every teenager is holding a smartphone. To develop and test the appropriate content on the media, we applied research and development scheme by (Borg & Gall, 2003) [6].

Climate change is a common problem in the worldwide due to the massive impact not only on the environment but also to the human and animal. Accordingly, integrated participation from the entire community is mandatory. Nonetheless, an adolescent who is part of the community, recognised has insufficient knowledge about climate change [7]. Several pieces of research have been done to promote mitigation and adaptation in climate change [8]–[11] but a few of which involving teenager on their research. Even though, the teenager is an investment to spread information due to the owning of the extensive community. For example research on HIV/AIDS in Massachusetts which engaged the youth in adolescent peer leaders program [12].

Climate change has predicted affecting the lives of individual, household and community; it is the reason everyone should have the same spirit to decrease climate change impact. Accordingly, the adaptation capacity is more accessible to develop among the community [2]. The teenager is a population who have a lot of friends, group and community because they in seek of self-identity [13]. It is why the teenager is a promising agent of change in the society, including in climate change resilience improvement. Unfortunately, the majority of the teenager have insufficient knowledge about climate change. This statement is supported by research in Singapore which conducted a study among secondary two and three students. This research found that there was a misconception of climate change among them [14]. On the other hand, teenager challenging to find an appropriate climate change source related to their age stage. Correspondingly, a study in Iran revealed that the limited access to climate change information contributed to the level of knowledge in the student [15]. Even though, the rapid development of information technology gives us an opportunity to custom it as a tool in climate change communication. This opinion is supported by our previous finding that stated family and internet were the teenager favourite information source [7]. Accordingly, there is a need to develop media in particular for a teenager with a purpose to communicate the climate change impact. United Nations Framework Convention on Climate Change (UNFCCC) built the framework for education, training and public awareness

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on climate change. The effort to improving community awareness could be made through two steps: (i) encourage and facilitate from sub-regional till national level under the national laws and regulation within in the local context, (ii) in international level, collaborate and disseminate through existing body [16]. In step one, stated as part to reach that goal, it is essential to serve information which free access for the public on climate change and its effects. The quite similar framework is proposed by WHO to improve awareness of climate change impact on health [17]. Accordingly, this research attempted to build and test climate change information source for a teenager using social media.

2 METHODS

2.1 Research type, research site and participants
Research and development were applied by following (Borg & Gall, 2003) [6] consists of 10 stages: (1) research and information collecting, (2) planning, (3) development of an initial product, (4) preliminary field testing, (5) preliminary product revision, (6) primary field testing, (7) operational revision of the product, (8) operational field testing, (9) final product revision, and (10) dissemination and implementation. However, due to the lack of funding, this research following the first four steps and will continue the rest of the phase in the next project.

Related to this study, research and information collection was conducted in the previous study by finding that there was a lack of teenager knowledge on climate change. Afterwards, talking with family and using the internet were identified as the preferable informative source [7]. Accordingly, a website, Facebook and Instagram were chosen as a media platform. The designation of Instagram and Facebook considering a previous statement that 9 out of 10 teenagers at least have one of the mentioned social media [18]. In Indonesia, by 2016, noticed more than 27 million active user social media [19], with Facebook and Instagram, are very popular. While website, it was developed to test the access rate of our official platform since generally an institution using the website as the media for spread the related information. This research was conducted in Yogyakarta City, Indonesia. The participant was twelve teenagers aged 16-17 years old from 3 high schools.

2.2 Research courses
The research was started by planning which was consisted of three activities 1) developed the platform 2) developed the platform content 3) expert validation. Platform and content developing were performed by the research group. The material was developed using an attracting picture and a short explanation. We provide the content on Bahasa Indonesia.

Expert validation, it involved the teacher from three associated school where the participant comes. Teacher validator was a teacher who teaches natural sciences or geography subject. The designation of the teacher based on a discussion with the headmaster by considering the research purpose. Expert validator was responsible for providing an input to the content by adjusting with high school student level. They have to look at the sentence, picture, and the

information order. Their comment then was discussed to the research team. After expert validation was completed, the research group installed the content on the media, i.e. Instagram: @kajian_manusia_lingkungan, Facebook: https://web.facebook.com/CHESFKMUAD/, and Website: http://pkml.uad.ac.id/. The three media have the same material both the images and sentences. This step means that we produced the initiated media to perform the small trial. A small trial or preliminary field testing was held among 12 participants with total duration was four weeks. The number of the participant considered the trial purpose that is to get the qualitative evaluation of the initiated platform [20]. During the trial, the participant attended the distance learning by access the media provided. To monitor the involvement, the participant asked to put a comment when they accessed the media platform. The evaluation was performed twice during the learning course. Firstly, was in the first two weeks. A Focus Group Discussion (FGD) was held at the end of week four to receive the participant opinion about the learning. Secondly, was in the last two weeks, the participant was asked to re-access the media. At the end of week 4, we re-evaluated to obtain comment and opinion from the participants through an FGD. Informed consent was requested before the trial. Participants also asked to fulfil pre-test questionnaire to assess the baseline knowledge before the prosecution and post-question at the end of the trial period. The pre-post questionnaire which consisted of multiple choices question, it asked about: the impact of climate change on poverty, climate change impact on human, climate change impact on the environment and animal.

2.3 Data Analysis
Qualitative descriptive and quantitative descriptive was applied to analyse the result. Qualitative descriptive was used to investigate data from expert validator and evaluation part from the participants. While quantitative descriptive was used to calculate pre-post-test among the participant by using the following formula:

$$Percentage\ each\ question = \frac{xi}{xn} \times 100\%$$

With $\sum xi$ = Number of answers
        $\sum xn$ = Total of answer

2.4 Ethics Statement
Research ethics was approved by the Ethical Review Board of Universitas Ahmad Dahlan, Yogyakarta Indonesia (011707110).

3 RESULT

3.1 Expert Validation
The teacher expressed that the content is appropriate, understandable and communicable. However, they suggested complementing the narration with the real picture such as flood and drought in Indonesia to have an easier illustration. Likewise, the teacher asked to explore more detail about greenhouse gases effect clearly to avoid misconception among the participants (student).

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3.2 Participant evaluation

The evaluation was divided into two rounds. First evaluation which was conducted in the first of two weeks found that whole participant chose Instagram as their information source with reason: (i) it is picture based and (ii) easy for access from the smartphone. They said seldom or even never to access Facebook also The Website. After that, regarding the content, participant gave their feedback as follows:

- adding a more exciting picture
- putting the real fact picture not a cartoon, since picture roles as the key to people decide whether will access or not
- making the hashtag sharper and avoiding the typo

Second round evaluation was conducted in the last of two weeks. Participant remains said that they prefer to access Instagram compared the other two media that we provided. They delivered the feedback as follows:

- avoiding a repetitive content
- avoiding the typo
- adding information in the Indonesian context.

The participant said that the content has improved their knowledge and gave benefit to them after their participation in the trial.

3.3 Pre-Post test

Pre-post-test sought the changing of participant knowledge before and after the learning process by accessing the media. This test revealed that there was a knowledge improvement of the participant. Thus, we can see from the different percentage of the correct answer given by the participant. Concerning the impact of climate change on poverty, the correct answer increased 26%. While participant perception about a million people will suffer from climate change, the agreement improved 8% between before and after. Regarding flood as the impact of climate change, participant knowledge advanced 16%. Then when asked about the losing habitat of the animal due to climate change, participant agreement grew 34%. Lastly, participant knowledge about the impact of climate change on increases the occurs of the storm, upgraded 25% (Figure 1).

Figure 1. Pre-Post knowledge assessment among participant after the trial in Yogyakarta, 2017

4 DISCUSSION

This present research was conducted to initiate the developing and to testing in the small group of the media to inform about climate change and the impact, in particular, targeting
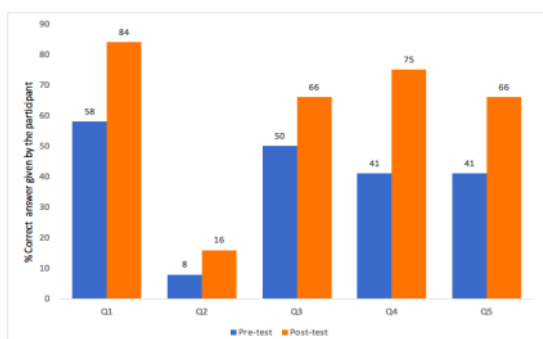
Statements:
Q1. Climate change will be increasing the number of poverties
Q2. A million people will suffer from climate change
Q3. Climate change undoubtedly will cause flooding
Q4. A lot of animals will lose their habitat due to climate change
Q5. Climate change will cause a storm more frequent

the teenager. Accessing and reading the media provided has proven can improve the climate change knowledge. Nevertheless, whole participants have chosen Instagram as their information source with reason that it is picture based and accessible from the smartphone. This result is supported by a theory that picture is more powerful compared to text in delivering a message [21]. On that specific research revealed the picture conformity of the product in online media determining consumer behaviour. Accordingly, it was identified that picture becomes an entry point to attract the teenager attention. In our setting, according to our previous research [7], revealed that the teenager's knowledge weaknesses in some climate change topics. Participants were doubtful that climate change possibly causes flooding. Accordingly, we provided participants with a picture about flooding in some places and the explanation about the relationship between climate change and flooding. This topic is essential to know as said by research that the high intensity of rainfall and frequent extreme weather will cause flooding more often as the impact of climate change [22]. In addition, flooding pattern is hard for mapping [23]. In another hand, flooding carrying domino effect meaning that when flooding occurs will be followed by another impact such as reduce the health quality the population connecting to the disease for example leptospirosis [24], diarrhoea, malaria and malnutrition [25]. In another content, we also served picture and information about the increasing number of some diseases due to climate change such as vector-borne disease and respiratory disease. Moreover, skin cancer is discussed as a direct impact of climate change impact. Accordingly, we provided the participant with related information to improve their awareness. Another knowledge that was missed by the participant's attention was the losing habitat of animal caused by climate change. Accordingly, we shared some information from the third party to fulfil this knowledge gap. As a result, after their participation in this research, the attention improved 34% relate to this problem. The awareness of this problem is essential to avoid animal distinction. Currently, the researcher is investigating the impact of climate change on Antarctica [26] including the effect on the animal. Polar Bear in the Antarctica and seals are two example of an animal who survives from climate change impact because they are challenging to find food and changing the habitat [27]. While in Indonesia, turtle population was identified decreasing due to the extreme climate event, for example in Jembrana-Bali which confirmed that case [28]. Participant has low attention on the occurrence of an extreme weather event such as storm as climate change impact. Storm predicted will occur more frequently due to climate change and give a massive effect to the community [23], [29], [30]. Indeed, in Indonesia, the storm is an infrequent event because the geographic position is in low latitude, may this be the caused the low participant awareness.

5 CONCLUSIONS

This research may have a contribution to improving community awareness of climate change by performing environmental education through integrating with

Technology Information (TI). As widely known that social media grows rapidly and reach a large population across the world. Accordingly, providing free access information for the public as UNFCCC and WHO framework on climate change is achievable. However, this study also possibly has some weaknesses: first, we did not engage the information and technology expert when developed the website. Nevertheless, it not become a problem because participant did not access the website as their information source. The second weakness, we did not involve picture designer in serving the picture. In sum, this research is necessary to continue to the next step: (i) trial in the larger group, (ii) content need to update routinely. Therefore, future research is suggested to fulfil this research gap. As a recommendation, it is essential including climate change topic in the school curricula to increase teenager climate change knowledge. In addition, the intended authority can use social media as a climate change campaign tool for the teenager as it was proven increasing teenager understanding.

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