

Developing Augmented Reality for the Guidance and Counseling Service in Elementary School

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Abstract—The objective of the study is to develop augmented reality media of the Guidance and Counselling service for Grade V students in Cepit Public Elementary School Bantul. Then, the other objective of the study is to validate the augmented reality media so that the augmented reality media will be feasible for a test. Within the conduct of the study, the method that had been implemented was the researchers and development model proposed by Borg & Gall up to the stage of product validation. Then, the activity plan consists of needs analysis, planning, preliminary product development, and product validation test. The results of the research and development study show that the augmented reality media of Guidance and Counselling service has been validated and has been feasible for test. The statement might be confirmed by the validation results from the material expert, which shows that the learning materials have been in accordance with the learning objectives and the learning characteristics of elementary school students. On the other hand, it is also confirmed that the media validation has been in accordance with the criteria of augmented reality media. The feasibility of the media might be confirmed through the following findings: 1) the score of material expert validation is 4.80 (very good); and 2) the score of media expert validation is 4.44 (very good).

Keywords— *augmented reality, guidance and counseling, elementary school students*

I. INTRODUCTION

Recently, the phenomenon of violence has been a tradition attached to the Indonesian people. There has not been any day that passes without the news of violence. Indeed, violence has been increasing in terms of number, type, and quality. Furthermore, both perpetrators and victims become more varied in terms of sex, background, and age level. The culture of violence itself has even reached the domain of education. Not only in the level of high education, but the culture of violence also takes place in the lowest educational degree namely elementary school. The violence that occurs among elementary school students is a very concerning phenomenon [1]. In this case, the term violence might be described as an action that utilizes physical power, threat, or action in attacking other students or other groups of students that are harmless resulting in death, physical disorder and loss or maldevelopment.

Quoting from the official page of KPAI, 84% students used to suffer from violence in the school, 45% male students mention that teachers or school officers are the perpetrator of the violence, 75% students admit that they used to commit violence in the school, 22% female students mention that teachers or school officers are the perpetrator of the violence and 50% students report that they suffer from bullying in the school [2]. Departing from these data, it is apparent that the act of violence committed by the peers in the school throughout Indonesia has been increasing. The act of mocking, making fun and insulting among the students still occur up to date. These behaviors are considered normal behaviors and as part of social relations among the students whereas actually, these behaviors lead to the form of bullying. People are not aware of the consequence that will appear if the students experience bullying. Not to mention, the cases that have been previously mentioned are also part of bullying. In education, the term bullying refers to the aggressive behaviors displayed concurrently by a stronger student or a group of stronger students to the weak students under the objective of hurt the weak ones.

In the level of elementary school, classroom teachers are demanded to perform the Guidance and Counselling while they are teaching altogether at the same time. The reason is that elementary schools have not been equipped with Guidance and Counseling teachers. Then, in conducting the Guidance and Counselling functions, the presence of facilitative instruments for delivering the learning materials becomes highly important since the clients are the elementary school students [3]. In Guidance and Counselling, the term media refers to all kinds of objects that might be benefitted for delivering the Guidance and Counselling messages that might stimulate the mind, the sense, the attention and the willingness of the students/the counselees to understand themselves, to direct themselves, to make decisions and to solve the problems that the students/the counselees have been dealing with [4]. The creative use of media will expand the opportunity for the students to be interested in Guidance and Counselling service, to learn more, and to perform skills in accordance with the objectives of Guidance and Counselling.

Within the provision of Guidance and Counselling service, especially in the elementary schools throughout Indonesia, the role of classroom teachers in implementing the Guidance and Counselling functions has not been optimum yet whereas the conduct of comprehensive Guidance and Counselling service might provide a space for the classroom teachers to implement the service within the learning process under an integrative manner. Furthermore, the information in relation to the prevention of violence and bullying is one of the important materials for the efforts of preventing the act of violence and bullying within the elementary schools. With regard to the situation, media can be one of the facilities that help the teacher to deliver the information in the Guidance and Counselling service. The results of the preliminary questionnaire distribution show that most of the students have not understood that their behaviors are the actions that lead to bullying since they consider that their behaviors are merely parts of jokes. Up to date, there has not been any special socialization on this matter since the position of Guidance and Counselling teacher is absent. Not to mention, the materials available in the mass media and the social media are sufficient to provide knowledge about the characteristics, the behaviors and the impacts of bullying but, unfortunately, these materials are less interactive and most of the available information have not been appropriate to the context of elementary school students [5]. On the contrary, most of the Grade V students in Cepit Public Elementary School in the Regency of Bantul already possess and actively use their gadget; consequently, these students have already been familiar with the technology.

One of the ways for solving the problem that has been elaborated above is developing augmented reality media as part of Guidance and Counselling information service in order to prevent violence and bullying among elementary school students. The presence of the media will not only help the elementary school students to understand the danger of violence but also the teachers to conduct the Guidance and Counselling service in the elementary schools. Therefore, within the study, the researchers would like to develop the augmented reality media for the Guidance and Counselling information service among the Grade V students of Cepit Public Elementary School in the Regency of Bantul.

II. METHODS

Within the conduct of the study, the researchers adopted the research and development model proposed by Borg & Gall [6]. The product that should be generated was the augmented reality media of the Guidance and Counselling service for the elementary school students. Then, within the conduct of the study, the researchers only implemented four stages of the model namely needs analysis, planning, preliminary product development, and product validation test. After the data had been attained, the researchers implemented the qualitative analysis and also the descriptive analysis. The data were gathered by means of questionnaire distribution. The questionnaire later would serve as part of material expert and media expert validation.

Preliminary Product Development

The steps in the preliminary product development were as follows:

- a. Developing the shape and the model of the product that would be developed, namely the puzzle about bullying.
- b. Identifying the hardware for developing and running the media, namely the smartphone.
- c. Defining the software that might support media development, namely Reveal Studio smartphone application, Unity 3D and Vofuria.sdk, Corel Draw X7, Adobe Photoshop, and Adobe Premiere Pro.
- d. Gathering references as the media material, namely Sahabat Keluarga Official Website by Kemdikbud.
- e. Developing the system components and the application design in the form of a storyboard.
- f. Creating the interface design; in this stage, Corel Draw X7 and Adobe Photoshop were operated in order to create the pictures that would be stuck on the puzzle, while the Adobe Premiere Pro was operated in order to create video content that consisted of the material that would appear when the puzzle was scanned. Furthermore, Reveal Studio smartphone application was operated in order to create the augmented reality (AR) system. This application served to process the picture when the picture was scanned. This application might be downloaded from Playstore.

III. RESULT AND DISCUSSION

Result

In this section, the researchers would like to deliver and discuss the results that have been attained in the study. These results and their discussions might be consulted in the following section.

3.1 Needs Analysis

In this stage, the needs analysis was performed by distributing the questionnaire about bullying to the students. The data that had been gathered in this stage later served as the preliminary data. In addition, an interview session was also conducted to the classroom teachers.

The results of both the observation and the interview with the teachers and the students in the State Elementary School Cepit indicated that the behaviors such as mocking friends, saying rude things, fighting, and even fawning had still been found in the school. These behaviors had been apparently high in the classrooms. The action that the teachers took whenever these behaviors appeared was advising the students to not repeat such behaviors again. However, if the students had committed the same behaviors again then the teachers would have taken stricter actions. In relation to such situation, the results of the questionnaire show that most of the students had not been aware that their behaviors had been leading to bullying since they had considered that these behaviors had been some sort of jokes.

All the time, there had not been any special socialization on this matter because the specific position for the Guidance and Counseling teachers had been absent and, not to mention, there had not been any specific occasion for holding the socialization. Indeed, the materials that had been available in the mass media and the social media had been providing quite plenty of information about the

characteristics, the behaviors, and the impacts of bullying. However, these materials had not been interactive and most of the texts within these materials had not been compatible with the elementary school students whereas the students in the State Elementary School Cepit had been familiar with the gadget and they had even been actively using the gadget. In other words, the students had been familiar with the technology.

In relation to the statement, the material delivery by means of technology has been proven to draw the interest of the students and even to motivate the students during the learning process [4]. This statement is in line with the results from the study by Garrido [7], which states that Augmented Reality has an important role in the process of facilitating the users or the visitors in understanding their educational inheritance. Since the role of Augmented Reality is to facilitate the learning process and to turn the learning process into a fun process, the response of the users, or specifically the students, is good and positive. In other words, it might be implied that the development of the augmented reality-based learning media has been in accordance with the needs of the students.

3.2 Planning

In this stage, the research should collect all of the relevant references for material development. Most of the references about bullying almost similarly acclaim that bullying might take place anywhere and might lead to fatal impacts due to improper handling. Then, several references such as "Ayo Bantu Anak Hindari Perundungan" discuss the impacts of bullying [8]. These references specifically explain the forms of bullying and the characteristics of both the bullying students and the bullied students. On the contrary, for the development of the augmented reality-based media, the software that has been selected is HP Reveal Studio, Corel Draw X7, Adobe Photoshop, and Adobe Premier Pro. The software has been selected based on the premise that Augmented Reality enables flexibility within the use of interactive media for both the learning process and information delivery

3.3 Preliminary Product Development

In developing the preliminary product, the following procedures should be followed:

- a. Defining the shape and the model of the product that should be developed, namely the puzzle of bullying.
- b. Identifying the hardware that should be used for developing and running the media, namely the smartphone.
- c. Defining the software that will support the media development, namely HP Reveal Studio, Unity 3D and Vuforia SDK, Corel Draw X7, Adobe Photoshop and also Adobe Premier Pro.
- d. Gathering references as the media materials, namely the *Sahabat Keluarga* Website under the management of Kemdikbud.
- e. Developing the system component and designing the application by means of storyboard.
- f. Developing the interface design through the following sequence: 1) operating the Corel Draw X7 and the Adobe Photoshop for drawing the pictures that will be attached to the puzzle; 2) operating the Adobe Premier Pro for

creating the video content of the materials that will appear when the puzzle is scanned; and 3) using the HP Reveal Studio for designing the Augmented Reality system because the Augmented Reality system later will play a significant role in the scanning process of the picture.

At the end of the procedures, an application will be generated and the application might be downloaded via Play Store.

3.4 Product Validation Test

In order to ensure the validity of the product that has been developed, the product validity test should be conducted. In the study, the product validity test consists of two stages and each stage might be elaborated as follows:

a. Validation by Material Expert

Material validation is conducted in order to gather feedback about the materials that have been developed. The aspects that should be assessed in this stage are: 1) the compatibility between the learning materials and the learning objectives; 2) the provision of the learning directions; 3) the provision of examples within the material presentation; 4) the opportunity for the students to perform reflection; 5) the learning process that enables the students to understand bullying; 6) the interesting material presentation; 7) the correctness and the recency of the learning materials; 8) the accuracy of material coverage; 9) the quality of material presentation; 10) the quality of feedback. The mean score of the material expert is 4.80, which indicates that the product has been very fit and feasible for the experiment.

b. Validation by Media Expert

In addition to the material validation, media validation is conducted in order to gather feedback about the media that has been developed. The aspects that should be assessed in this stage are: 1) the direction clarity; 2) the color composition; 3) the accuracy of font type; 4) the accuracy of font size; 5) the accuracy of font color; 6) the accuracy of layout; 7) the accuracy of narrative; 8) the accuracy of picture use; 9) the quality of picture display; 10) the quality of screen display; 11) the level of interactivity between the students and the media; 12) the animation layout; 13) the carrying capacity of the music; and 14) the performance of the software. The mean score of the media expert is 4.40, which indicates that the product has been very fit and feasible for the experiment.

Discussion

The augmented reality media has been developed based on the needs analysis elaborated in the sub-planning section. The manufacturing process of the media is technical by gathering relevant references for material development. On the contrary, for the media development, the researchers have operated Reveal Studio smartphone application, Corel Draw X7, Adobe Photoshop, and Adobe Premiere Pro.

Then, the product validation proceeds through several stages namely material validation and media validation. The product validation is performed by involving academically and professionally competent validators in their respective domain so that the researchers might attain comprehensive feedback for the feasibility of augmented reality media in the test. The advantages of the augmented

reality media that have been developed are: (1) the augmented reality media might be one of the learning source alternatives that are in accordance with the digital era; and (2) the augmented reality media might provide insight about bullying to the students.

Another element that becomes the advantage of the augmented reality media lies in the puzzle. The puzzle is involved in the learning process because it is able to trigger the students' curiosity and to provide alternative activities that elicit the students' psychomotor skills in combination with video, animation, and figure. This combination will ease the students for understanding the learning materials. A study by R.M. Garrido (2015) shows that augmented reality has an important role in facilitating the users or visitors in understanding the inheritance of their education. The reason is that augmented reality is able to facilitate the learning process and to provide an enjoyable learning process. As a result, the users or students provide a good and positive response.

On the contrary, the weakness of the augmented reality media is that the augmented reality media is highly sensitive to the point switch. Consequently, the point should be the same. Not to mention, the operation of the augmented reality highly depends on the smartphone network and therefore the researchers suffer from technical obstacles in displaying the material. With regard to the situation, there should be more fixed software.

From the aspect of materials, the materials that have been delivered in relation to bullying already in accordance with the objective. The accordance has already met one of the Competence Standards for Student Independency [9] within the Foundation of Ethical Behaviour, namely identifying the benchmark of good deeds and bad deeds. Furthermore, the statement is also supported by the opinion one of the contents or the topics of guidance in the Guidance fundamental service [3] is the personal and social development which consists of: (1) character education; (2) conflict resolution; (3) violence prevention; (4) life significance designation; (5) drug abuse prevention; and (6) culture understanding.

IV. CONCLUSION

Based on the results of the research and development initiative, the researchers would like to draw several conclusions:

1. The research and development initiative has been conducted through several stages namely: (1) needs analysis; (2) planning; (3) preliminary product development; and (4) product validation. The needs analysis is conducted in order to review the matters that have relevance to the product that should be developed. Then, the planning is conducted in order to define the product that should be developed in accordance with the results of the needs analysis and the theory. Next, the preliminary product development is conducted in order to design the product that should be developed. Last but not the least, the product validation is performed in order to attain constructive feedback from the experts for the product.
2. The quality of augmented reality media for bullying prevention belongs to the "Very Good" category with the mean score of 4.8. Then, the augmented reality media have been scored 4.4 by the media expert. If the score is converted into the qualitative assessment, then it might be concluded that the augmented reality media have been very good and feasible for test.

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