Mobile Art Application (MATA) as a media for handling cases of aggression in children

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Abstract. The difficulty experienced by most children is ability in terms of emotional control. So that they often have difficulty in conveying the things they want. And the culmination is an attitude of aggression in children. The solution to this problem is psychological therapy. Many therapeutic models are commonly used in the field of psychology, one of which is art therapy. The method used in this study is the experimental psychology method. The problem solving strategy in this study uses a technological approach. Art therapy is made on the basis of mobile technology, so that its application becomes more interesting and interactive. Children can freely express visually their thoughts and feelings through scratches and colors on an image on paper. The results of the scratches will appear in the form of 3D objects using augmented reality technology. The creation of applications in the form of real time coloring in augmented reality objects, is expected to be a medium for channeling emotions for children. So that it can be used as a therapeutic medium that can reduce the level of aggression in children.

1. Introduction

According to the Indonesian Dictionary, aggression is a feeling of anger or rude action because of disappointment or failure to achieve satisfaction or goals that can be directed to people or objects, with other meanings that are hostile actions that are physical or psychological attacks on other parties. Children are the most vulnerable to cases of aggression. One of the triggers of aggression in children is a lack of children's ability to communicate. Children who are not able to communicate, usually have a tendency to have difficulty expressing their displeasure with other people's behavior. As a result, the way they take to show unhappiness is to be aggressive [1]. Constraints in communication also make children less able to express their desires or desires to others, so the way to get what they want is to act aggressively.

There are many models or types of psychiatric cases that can be applied, including in cases of aggression in children. One method is Art Therapy. Art Therapy is the provision of psychological assistance with art media. The American Art Therapy Association (AATA) states that art therapy can be interpreted as an activity that uses creative processes in interesting media to improve mental and emotional individuals at all ages [2]. In simple terms, art therapy is included in the category of therapy that involves a combination of colors, pencils, pictures or other things that are fun and integrated with psychotherapy therapy and creative process techniques. Through this art therapy one can bring out the subconscious experience and from the person's feelings will be seen. The arts devoted to this therapy include drawing and painting. Art has provided a way of understanding, understanding and inner
experience without having to explain using words. In addition, drawing skills are basically more than intuitive and intuitive.

Therapy is considered most appropriate for children who have limited speech or fear in children to express feelings through verbal. Often when children are faced with problems, they find it difficult to express their problems verbally. The aim of this therapy is not to make children as artists but to express the expressions of the subconscious of children without intervention, so that what is produced by children is a reflection of the souls of the children who are most deeply. Furthermore, based on the visualization that is poured during therapy, several images often appear that are symbols of the patient's unconscious expression. Then for therapists, this visualization variation is a tool to determine the diagnosis to what extent the patient's mental condition is damaged, and what type of treatment is suitable for the patient.

Giving media (a tool for doing Art Therapy) will invite children to explore, feel, and play. Children can experiment and feel negative emotions and can be channeled immediately through art graffiti. When using media, children's focus is on creativity. All media invites children to explore, feel and play. Children can use media to make pictures, present symbols of problems, feelings, and themes related to the story or the final part of their story [3].

Applied media used can be based on information technology (IT). The use of IT-based media is the right solution in this matter. This is because the IT-based system has a high interactive level and is always growing rapidly. Media IT can be a variety of applications that have advantages in each application. One of the media that can be utilized is Augmented Reality (AR). To be able to give a real impression, augmented reality technology is used [4, 5]. The use of this media aims to make the output of the application look more interactive and varied. 3D objects that appear can be made according to needs. Interactive processes occur by applying the concept of real-time coloring in augmented reality [6-8]. So that when the user gives a scratch on the marker, then the scratches have an impact on 3D objects in real time [9].

Referring to the explanation above, the purpose of this research is to create the concept of mobile-based psychological therapy tools. In this application, applied augmented reality technology with excellence can accommodate real-time coloring commands on 3D objects [10]. It is hoped that this application can be a new breakthrough for psychological therapy, especially cases of aggression that afflict many children.

2. Methodology

2.1. Requirement
In making interactive Augmented Reality some supporting tools are needed including:

- Unity 2018.2 17f1
- Vuforia
- Blender
- Adobe Photoshop
- Open Space 3D
- Marker for augmented reality

The use of software above is not absolute use, but can be replaced with other similar software and has almost the same function. The functions of each software will be interrelated with each other, so that in making applications based on augmented reality there are many stages that must be passed [11].

2.2. Designing
The main thing in building an application based on Augmented Reality is to make a 3D model as an output and also make a marker as a trigger to bring out the output. In making output modeling there is a need for detailed image shapes. Making model output can be done using Blender software. In the software, the object will be recognized as a 3D form and can also be arranged in basic shapes, sizes and
colors in detail. In this explanation, the design of the model will be shown using an example of a cube shape. In figure 1, it is shown the shape of the cube and also the webs. From Figure 1, an explanation is obtained that to build a cube, six pieces of square are needed. The collection of the square forms the cube nets shown in the image below as modeling in a 3D blender.

![Figure 1. 3D object nets.](image1.png) ![Figure 2. Modeling nets in blender.](image2.png)

From this it is the reference to model the output in the form of cubes. So that it can be excluded if the output is in the form of a living creature or another that requires detail, then the nets of formation are more and more detailed. The output object in this application will be shown in Figure 3. The image is also used as a marker in augmented reality. To make a 3D object like in the picture, some steps are needed, one of which is mesh processing. Mash is used to form nets in objects. The purpose is to get details of each side of the object. Details of each side are needed when wanting to display 3D augmented reality objects.

![Figure 3. Application marker.](image3.png) ![Figure 4. Example of mashing an object.](image4.png)

After the design of the net is complete, the next step is to make a 3D model in a blender. In accordance with the statement at the beginning that the output is a cube shape, Blender's output is also in the form of a cube. To clarify, in Figure 2 the design of the output model will be shown using adobe Blender software.
3. Results and discussion

3.1. The Application of augmented reality

The image recognition process is performed on unity software. The use of this software to make it easier when making scenes in unity. In addition, in 3D unity there are also many features that support the creation of AR applications, among which are, User friendly (easy to use), Powerful (many functions are made very easy so they can provide a lot of display interaction), the technology is always up to date. on the web and desktop (easier). Collaboration between open space 3D and Unity can produce Augmented Reality applications that can truly be updated in texturing contexts in AR.

Markers that have been made are then entered into the software unity editor to display the 3D model. The first thing to do is introduce markers and 3D objects into unity. In Figure 6, the Screen tree is displayed, the UV exportFBX file appears in the scene created in Open Space Editor. The FBX file is a file that was created previously in the Blender software.

After the file has been edited in such a way and introduced to the software, 3D objects can be displayed without using markers. This means that in this case the trial to bring up the marker on the monitor is successful. Figure 7 shows a 3D model that has been successfully raised. In the image, the Cube model appears in the middle of the form because the initial setting appears is in the middle. The location of the cube then follows the position of the marker when scanned by the camera. The Library AR Marker is used to introduce marker images and adjust the pattern of occurrence of markers. In Figure 8 a Library
AR Marker is displayed, the marker installed on the application is exportFBX. This file is the core of the concept of augmented reality in real time.

The figure shows the marker that has been successfully raised and given the behavior of Problem-Solving texturing. The marker is given a numerical writing directly and successfully accommodated by the application by displaying the text that has been written. In Figure 9 the final results of augmented reality are displayed. There is delay when displaying due to weak calibration. There needs to be improvement in the system to overcome this weakness. This then becomes a reference for further development. This application can be developed by making more detailed markers for a more attractive appearance.

3.2. User aggression test
This research was conducted to determine the effect of drawing activities on the aggressive behavior of children aged 5-7 years in Muslimat NU 1 Kindergarten, Malang City. From the results of the research and hypothesis testing conducted, it was found that there were differences between the control group groups who were not given drawing activities and the experimental group given drawing activities to children aged 5-7 years in Muslimat NU 1 Kindergarten, Malang City. The discussion in this study can be described as follows:

3.2.1. Identify aggression behavior in children aged 5-7 years. Based on the results of the respondents' distribution based on age, it shows that the subjects in the experimental group were mostly 6 years old as many as 26 children (72.2%) and minorities namely 5 years as many as 2 children (5.6%). While in the control group the majority were 6 years old, 15 children (41.7%) and a minority aged 7 years as many as 1 child (2.8%). In this study, it was found that the age of 6 years more often carried out aggressive behavior.
Results of direct observation in Muslimat NU Kindergarten 1 Malang older children have more active habits that cannot remain silent and often disturb their friends and that is inversely proportional to younger children who tend to be quiet. Children over 6 years tend to be brave to take revenge if hurt or disturbed by their friends, while younger children if hurt or disturbed are more passive not wanting to take revenge for fear.

Opinion from Ostrov that aggressiveness is one of the problems often experienced by children who are in the early age range. This is because children at the age of 5 to 7 years show aggressive behavior because there are several factors, namely developmental factors, frustration, negative emotions or anger.

3.2.2. Aggressive behavior before and after the MATA application (drawing). From the results of the research that has been done, it shows that in the experimental group the pretest-posttest category was low with 8 subjects being 30 the subject, category is being with 27 the subject into 6 subjects, high category with 1 subject being 0. While in the control group the pretest-posttest category was low with 9 subjects to be 11 the subject, category is being with 21 Subjects were 18 subjects, high category with 6 subjects to 7 subjects. So aggressive behavior in the experimental group after drawing activity has decreased compared to groups that did not do drawing (control) activities. High, moderate, low aggressive behavior occurs in preschoolers due to the inability of children to control emotions. Aggressive behaviors that they show are physical, such as hitting, kicking, throwing, pushing, spitting and aggression can also be verbal as calling a name that is inappropriate, mocking, commanding, threatening, fighting. Such behavior can be caused because children are frustrated, environmental influences and children often watch television or violent films. Causes of physical and verbal aggressive behavior can be caused by the surrounding environment both at home and at school, if children cannot solve problems faced with an environment that does not support will trigger children to become more aggressive. Problems or conflicts arise when children experience feelings of guilt for not behaving and acting properly. Guilt, anxiety and fear can also be caused by thoughts that are different from the expected behavior. Explanations about physical and verbal aggression can be supported regarding the distribution of answers to each questionnaire statement namely "if the child is hit by someone, the child will hit him" after drawing activities with 6 subjects answering always in the experimental group and the control group. While verbal behavior is shown in the statement "children mock or laugh at a friend who is working on the problem from the teacher" after drawing activities in the control group with 7 subjects answered always and in the experimental group with 4 subjects also answered always.

4. Conclusion
The aggressive behavior of the group given the intervention to do drawing activities was mostly low aggressive behavior as many as 30 subjects (83.3%). Aggressive behavior of the group not given the drawing activity intervention was in moderate aggressive behavior, which was as many as 18 subjects (50%). There is an influence of aggressive behavior among respondents who carried out drawing activities with respondents who did not do drawing activities for children aged 5-7 years in Muslimat NU 1 TK City of Malang.

For further application development, it is necessary to add marker types and 3D objects to augmented reality. This aims to provide variations in the output of the application. So that users will feel more interested. In addition, it is necessary to apply the learning machine concept that adopts artificial intelligence so that analysis can be performed automatically based on the knowledge base of psychology experts.

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