Development of digital animation as a learning media in primary schools

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Abstract. Digital animation is an example of a concrete manifestation of a copyrighted work that combines computer applications in the multimedia field by combining images, text, audio, animation, and video so that it can modify a series of photographic images in such a way that they appear as if they are moving and making sounds and can become interesting story setting, especially for elementary school children. Also in modern times, digital animation can attract students' attention and help them develop their understanding of certain subjects. One of the most important theories that reflects how people learn through text and illustrations is the cognitive theory which states that people store more verbal and visual information than students do through words. Digital animation can be used as an alternative learning medium that can be used to bridge learning to be more interesting and to provide a new environment for students. Media is very important to be present in learning to produce stimulation, activeness, new skills for students, and understand the real form of learning applications.

1. Introduction
Learning is believed to be more effective when done through images and shared content than text alone. The integration of content with images has recently become a very interesting topic among researchers in the fields of education and technology. This unity is referred to as 'Multimedia Learning' [1]. For most of the time in education, these words become the most dominant way of teaching students. However, recent advances in technology have guided instructors and practitioners to move forward to the use of technology in the classroom. Thus, progress on digital illustration and methodology has been attempted digitally in Indonesia to educate children in schools [2]. This includes PC-based design strategies such as computer graphics. Nevertheless, there is still a need to work in the presentation area that can facilitate further learning. In other words, active learning requires media support to deliver the material that they will learn. The rapid development of the world of computer animation requires a lot of time. Animation began to be widely known since the popularity of television media that can present moving images resulting from the recording of the activities of living things, both humans, animals, and plants. If it is compared with still photos or still images, the animation is generally preferred by the audience because it can arouse enthusiasm and emotion. Along with the development of technology and science. In today's digital animation world its development is accelerating. Digital animation is a set of images that move and have a
purpose and purpose. Various types of animation exist today, one of which is an animated video. Digital animation videos are usually only a few minutes long. Digital animation is a medium that combines audio and visual with storytelling using animated steps or often called cartoons [3]. This digital animation is a video animation that results from processing digital images so it becomes a picture that moves. At the beginning of his invention, digital animation was made from sheets of drawing paper which were then "rotated" so that a moving image effect appeared. With the help of computers and computer graphics, making digital animation is very easy and fast. Digital animation is the making of moving images using a computer that is also a part of computer graphics and animation.

Following the age of development of students in elementary schools, digital animation learning media has an effective role in helping students learn and understand the concepts taught. The use of digital animation in learning is a step to make it easy for teachers to apply learning materials by their roles and functions. Based on the explanation, this research researched "Development of Digital Animation as Learning Media in Elementary Schools". This research focuses on the stages of making digital animation that can be used as learning media in elementary schools and how they are applied to learning.

2. Methods
The method in this study uses research and development design [4]. The research conducted in the making of digital animation as a medium of learning in elementary schools where the implementation is by describing in detail the making of digital animation, software used in making and implementing it as a learning medium in elementary schools. This research was conducted in Jumapolo sub-district Karanganyar Regency with its application in three elementary schools namely SDN 01 Ploso, SDN 02 Giriwondo, and SDN Karangbangun. Jumapolo District, Karanganyar Regency, Central Java.

The steps for developing digital animation as a medium of learning in elementary schools are to adopt a step in the development model that has eight stages, namely: (1) Analysis of learning needs and objectives; (2) analyzing digital animation products; (3) formulating the goals of digital animation products towards learning; (4) developing instruments; (5) developing the manufacture of digital animation products; (6) carrying out evaluation forms; (7) revision of the making of digital animation products; (8) design and carry out summative evaluations. The data used are qualitative and quantitative. Qualitative data were obtained from analysis requirements, expert material test questionnaires, test design experts. Meanwhile, quantitative data were obtained from product trials, namely field tests. The research design used was one group pretest post-test design [5,6].

3. Results and discussion
The first stage of digital animation video production is downloading the Plotagon application via Android, on the Playstore.
The second stage is preparing a digitally animated video narration, narration adapted to the theme and learning objectives in elementary school. The narrative that is compiled to create digital animation is a story that has been linked to integrated learning in elementary schools. The third stage is determining the character, the number, and character of characters adjusted to the narration that has been compiled. In this character selection, it can be adjusted starting from facial expressions and body movements to support the characters of the characters that have been made.

The fourth stage is determining the setting or place of digital animation illustrations, the setting is adjusted to the narration that has been compiled. There are various background options provided in the Plotagon application.
The fifth stage is to insert the recorded voice of the character into the Plotagon application, the sound can be from ourselves or other sound sources according to the narration that has been compiled.

The last stage is finishing, saving a digital animation video project that has been made.
Figure 5. Inputting voice recordings of characters in the Plotagon application.

This digital animation can be used in learning following the themes being learned at that time. Digital animation can be applied in learning as an alternative to supporting the achievement of the objectives of learning activities. A good digital animation in the storytelling can foster positive values and can increase students' love for their religion and their people. The love for the motherland and being able to understand the local wisdom of each region is one of the factors that can be raised in digitally animated videos.

4. Conclusion
Digital animation media in learning in elementary schools is an alternative to stimulate student activity, support understanding of concepts, and improve students' listening skills.

The advantage of using the Plotagon application in making digital animation videos is that easy use can also insert sound into the animation so that the dialogue delivered to the animation can be heard clearly. So it is very suitable to be used as a learning medium for elementary school students who at an age stage of development prefer audiovisual, by including aspects of the audio and visual senses, helping to optimize learning goals in elementary schools. However, this Plotagon application also has a weakness that is, to get a more varied background choice a paid subscription is required, so the choices that can be chosen are limited.

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