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The Effect of Blended Learning Model Assisted Video Animation to the Motivation and Learning Outcomes of Science

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Abstract: The aim of the study is to know there is or not the influence of using blended learning assisted video animation on the motivation and students' learning outcomes of science students of class fifth grade at Cilangkap 01 Pagi elementary school. This study is quantitative research using Quasi Experiment with type Posttest-Only Control Group Design. The study population is all fifth-grade students at Cilangkap 01 Pagi Elementary School in the second semester of the academic year 2021/2022. Sampling used Cluster Random Sampling. The samples of this research are 60 students from classes V-C and V-D. The instrument used a multiple-choice test consisting of 20 questions and a motivational questionnaire with 25 questions. Research data has been tested for normality, then obtained data were normally distributed. Hypothesis testing was using a t-test of t_{count}= 3.4983 which resulted in the rejection of H_0 at a significance level of about 5% with an effect size of 0.8063 is high in learning outcomes. While the average value of motivation in the experimental class is 60.89 and, in the control, class is 56.57 with an effect size of 0.46 is medium. This study concluded that there is the effect of the use blended learning model assisted video animation to the motivation and students.

Keywords: Blended learning model; Video animation; Science learning outcomes; Learning motivation

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Introduction

The Covid-19 pandemic has significantly changed the order in all fields, including the field of education. Education ranging from kindergarten to college which usually uses conventional or face-to-face methods had to be stopped because of physical distancing. With that, online learning is applied or also known as distance learning. This online learning system reduces students' motivation in learning and low motivation affects learning outcomes. This online learning model poses several challenges for all parties in the field of education. An important aspect that has changed a lot is the learning model that cannot be implemented optimally. In this situation technology is in an important place to be used (Amaliyah & Handayani, 2021).

The implementation of the 2013 curriculum requires teachers to always be innovative and creative in guiding students to be able to follow the learning process. Changes to develop learning today can use innovation, namely the use of blended learning techniques (Wulandari et al., 2021). The crucial question is whether the online element is capable of replacing an aspect of class time and allowing for greater flexibility without compromising the quality and performance of education. This is especially important in the context of the Covid-19 pandemic. Many universities and school have considered replacing part or even all of classroom teaching with an online learning environment, not only

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in the short term, but also in the future (Müller & Mildenberger, 2021). Blended learning is a technique of combining conventional learning and online learning (in the network) that is currently applied. According to (Safitri et al., 2021) with blended learning, technology is only a tool in the learning process because the main key is still with the teacher. Technology cannot replace the teacher's role, so teachers are required to be more innovative and creative in creating learning. Effective integration and use of technology can give consideration to the desired learning outcomes (Juliya & Herlambang, 2021). Blended learning has proven to be a promising learning model because the average score results in four areas of education, there are science, engineering and mathematics, are statistically proven to be much higher than the average score during conventional or face-to-face learning (Seage & Türegün, 2020).

Through this blended learning, students can learn dynamically and flexibly, where students can repeat and further explore the material that has been taught anytime and anywhere because students are facilitated to be able to learn independently with the help of the technology used (Gusmawan & Priatna, 2020). Blended learning is evolving as a pedagogical approach to teaching in elementary schools. The study found that students in elementary school made great progress when using blended learning models and later showed significant growth in reading tests (Prescott et al., 2018). Most teachers also encourage student engagement by making a connection between asynchronous and synchronous activities and explicitly emphasizing their networking. They schedule synchronous meetings (face-to-face or online) to complement asynchronous activities. In every way, students feel the added value of participation in unison, which in turn evokes a positive emotional response (Heilporn et al., 2021).

The existence of audio-visual media can be used optimally as a learning media during blended learning. The use of audio-visual media has an impact on all aspects of learning, the aspect is cognitive, affective, and psychomotor (Yuniastuti, 2021). An example of audio-visual media is animated video. Animated videos can display interesting images for elementary school children and there is an explanation of the material in audio form. With this animated video, it can reduce the boredom of students because the visuals displayed are very colorful and easy to understand. Researchers have made observations at Cilangkap 01 Pagi elementary school, learning is not optimal because the learning process carried out at Cilangkap 01 Pagi elementary school has not used audio-visual media as learning media and educators lack understanding of audio-visual media. And in science subjects, the water cycle material is abstract material that makes it difficult for students to understand because the place where the process occurs is wide and cannot be seen directly the whole process.

In learning, motivation is an impulse that makes interest or liking for a material or subject matter. Enthusiasm, curiosity, attention during learning is a form of high motivation. Good learning achievement will be achieved when students have high motivation which causes a like for learning. On the other hand, low learning achievement is due to poor learning motivation. The two will always be related to each other. Learning outcomes are one of the measuring tools to determine the extent of understanding and achievement of the material that has been delivered by the teacher and is mastered by students (Sutrisno, 2021). The strategies used by teachers so that their students obtain good learning outcomes will determine how students interact with the surrounding environment.

Good or bad interactions according to their understanding (Atika et al., 2020). To achieve predetermined learning goals. Teachers have a role to play in making student learning outcomes more improved. Where learning outcomes are often used as a tool to find out the success of teachers in delivering learning materials during the learning process. These learning outcomes are the most important part of learning (Simandalahi et al., 2021). Science teaches about all kinds of natural phenomena in the life processes of living things on Earth (Ibnu Badar Al-Tabany, 2017). Natural science is one of the important subjects to learn because it includes material about the natural environment that surrounds us. Science subjects cover 3 aspects of learning, affective, cognitive, and psychomotor aspects. Each aspect has a different role in the development of the potential of learners. Meanwhile, to develop these three aspects, teachers must be able to act as facilitators in providing stimuli to students through science materials and subjects (Ariawan et al., 2021). We as humans live side by side with the natural surroundings, so that with this science subject we can understand the processes and events in the natural surroundings. Like the water cycle process that occurs in everyday life. Blended learning may be the next step for science education. Unlike the existing face-to-face learning for science method courses, blended learning copes with special places, special instructures, and special times and provides students with out-of-class learning as well as time in class for active learning (Yılmaz & Malone, 2020).

The purpose of this study was to find out how much influence the blended learning model with the help of animation video had on the motivation and learning outcomes of fifth grade students in Cilangkap 01 Pagi elementary school. According to (Sadirman, 2018) motivation can be said to be the driving force of an individual to carry out certain activities to achieve a goal. Motivation itself can come from internal or external. Internal influences come from within oneself, while external influences can come from the home

environment, school, learning atmosphere, learning place and learning media used (Widiasworo, 2016). Learning motivation directly affects the behavior of students, encouraging them to use their energy and effort to learn, so that they will improve their learning achievement (Hwang et al., 2019). Motivation is able to generate enthusiasm and enthusiasm for learning and provide direction to learning activities so that the desired goals can be achieved. Learning activities can run optimally if there is high learning motivation in each student.

High motivation can be indicated by the enthusiasm and curiosity of students during learning. The enthusiasm of good students makes them look fun, comfortable, and serious during the material. The teacher's role as a learning manager is very influential during the learning process. Teachers must be able to manage learning as well as possible starting from the atmosphere, learning resources, time and classrooms. This learning management takes place from the beginning to the end of the lesson. If the class is managed properly, it will certainly raise student motivation (Arifin & Abduh, 2021). According to (Weniati, 2022) good learning motivation is an important factor in learning because it will affect the learning outcomes of students themselves. According to (Firdaus et al., 2020) there are several factors that affect the motivation to achieve, namely the existence of past experiences in each individual that cause differences in the high and low tendency to achieve, the local cultural background of a person lives when raised in a culture that emphasizes the importance of tenacity, competitiveness, initiative attitudes, and hard work, as well as an atmosphere that encourages a person to solve his problems independently without being haunted by the feeling of fear of failure, it will develop a high desire for achievement in a person.

Blended learning is a mixed learning consisting of e-learning and face-to-face. Combining conventional classes and online or online classes (Vasantan, 2020). Blended learning can be used to increase student participation in their learning process (Lapitan et al., 2021). Blended learning mixes synchronous and asynchronous learning. The combination of website-based learning, online platforms, video streaming with face-to-face conventional learning. The development of this mixed learning model is expected to combine online and offline learning to the maximum and the best (Riinawati, 2021). The blended learning approach teaches students to be directly involved in it. Involving students and teachers face-to-face and virtually makes students more active and easier to understand and master the material because students directly involved in the learning process and a pleasant teaching and learning atmosphere. Lesson accepted meaningfully because they can find their own answers by exploring a lot of material (Kasli et al., 2022).

For the advantages and disadvantages of blended learning itself according to (Widiara, 2018) the advantages are 1) with the internet network learning can be done anywhere and anytime, 2) teaching materials and teaching materials stored online which have been explained by the teacher can be studied maximally and independently by the teacher. students because they can be read or re-learned in an unlimited time, 3) when outside class hours, discussions can still continue with the agreement of teachers and students, 4) outside of learning hours, teachers can still manage and control their students, 5) before learning offline or face to face, the teacher can ask students to read the material first, 6) the target of the learning outcomes of the specified material is easier for students to achieve. Of course, in addition to having advantages as already mentioned, blended learning also has disadvantages, namely 1) skills in creating e-learning that teachers must have, 2) in developing and managing this mixed learning system, teachers need to prepare their time and creativity to the maximum 3) integration between e-learning and conventional learning which must be synchronous, 4) there are several teachers, students, and parents of students who do not understand the use of existing technology so that it often hinders the learning process, and 5) in this learning mix must be able to maximize existing potential.

To maximize this blended learning, teachers can use learning media like a animated videos. Because the use of animated video learning media for students at the elementary school level will attract their interest in the learning process. Nowadays, blended learning methods are well known by most educators. Many of them are using blended learning for a pandemic like today. Because with this blended learning method, student teaching and learning activities become easier, whether it is done online or offline. then the student can observe the simulation or visual images that exist to obtain information from the material to be observed so that the student has questions in him.

After giving problems in the form of photos and videos, students can discuss solving problems related to the photos and videos they watched and students can discuss finding agreements between other students. The use of animated videos can also help the learning process based on blended learning methods. The viewing of interesting videos can increase the effectiveness of teaching and learning for students and teachers. Videos that contain material explanations can make it easier for students to understand the material that the teacher conveys in the video. Advances in technology also affect this learning, with internet access students and teachers can very easily access the website that has been provided to be able to receive and convey

information (Wulandari et al., 2021). Animated video is a moving image that comes from a collection of images that are made into one frame into a video.

Animated videos are specially arranged and will move to form videos with a predetermined flow at any time. Objects in this animated video can be in the form of plants, animals, writing, buildings and so on. Audio-visual video media in the form of animated videos is included in the type of audio-visual media that can display image and sound elements in an integrated manner when communicating messages or information (Suryadi, 2020). Animated videos are videos created with computer original designs, images, illustrations, or effects that are made to move in interesting ways using a number of artistic styles. Animated videos are videos that use animations to deliver messages to viewers. In addition to a visual message, it's best to have a verbal or "voice" message stating the message as part of the video. The results of this study are expected to provide benefits for educators and students in the use of animated video media during blended learning during the pandemic. And for schools to improve the quality of learning and produce graduates who understand the knowledge that has been given.

Method

This research is a type of quantitative research. The method used in this research is a Quasy Experimental research method. While the type used is the Posttest-Only Control Group Design. This study involved two class groups called the experimental group and the control group. Comparison of group data was carried out at the end of the study. The class group that was given treatment using a blended learning model assisted by video animation was called the experimental class group. According to (Kurniawan & Puspitaningtyas, 2017) the population is the whole of the sample to be taken with the characteristics and qualities that are in accordance with what has been determined by the researcher. From the population, conclusions will be drawn after being studied by researchers. In this study, the population was 220 students, which were all fifth-grade students at Cilangkap 01 Pagi elementary school in the second semester of the 2021/2022 school year.

The sampling technique used was the Cluster Random Sampling method. Samples were selected randomly per class group. Then obtained samples from classes V-C and V-D studied with a total of 60 students. The control class carried out blended learning with Zoom Meeting and conventional but using Power Point during the material explanation process, while the experimental class was given treatment using blended learning model-based learning assisted by animated video media in conventional and online learning (on a network) via Zoom Meetings. For more details, see the figure below.

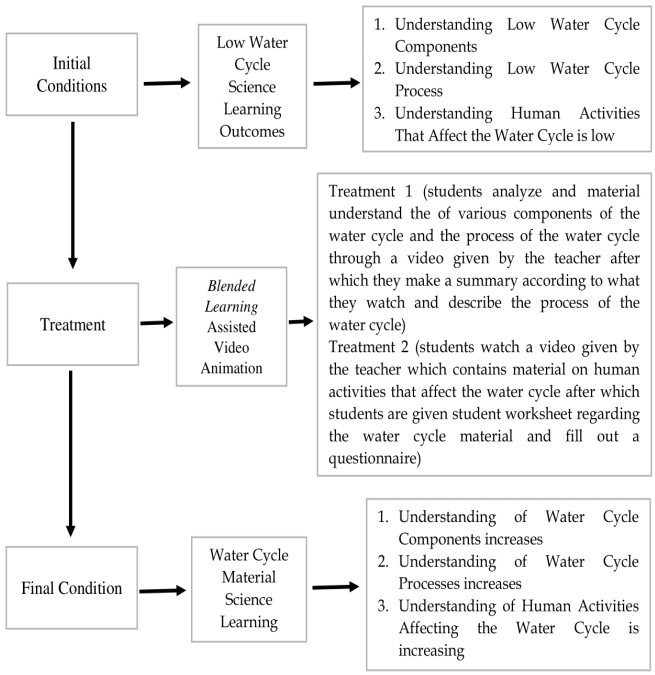

Figure 1. Framework of Thinking

The research instrument was an objective test in the form of multiple choice consisting of 20 questions regarding the water cycle and a motivational questionnaire with 25 questions. Techniques in analyzing and processing data in this study were carried out using Microsoft Excel software. The normality test was carried out as a prerequisite test in which the data between the experimental class and the control class were normally distributed. Furthermore, homogeneity test was carried out, homogeneity test was carried out to test the similarity of variance for the two populations. The homogeneity test used was Fisher's test (F). In the experimental class and the control class, a homogeneity test was then carried out to determine whether or not there were differences between the two class group variables. After obtaining homogeneous data, further testing is carried out by testing at the significance level = 0.05. And to find out the effect, testing is carried out with Effect Size. According to (Arikunto, 2018) the effect size has several criteria to determine the influence of the blended learning model assisted by animated videos on the learning motivation and learning outcomes of the following students. Effect Size criteria in table 1 below.

Table 1. Effect Size Criteria

Effect Size	Description
$0.2 \leq ES < 0.5$	Low
$0.5 \leq ES < 0.8$	Medium
$ES \geq 0.8$	High

Result and Discussion

Motivation Variabel

Data collection on learning motivation was carried out using questionnaires as many as 25 items. The total values of each class are summed up and then calculated the average and standard deviation. After that, the size of the influence category is calculated using effect size. Based on the analysis calculations that have been carried out on the learning motivation variable in the control and experimental classes, the data obtained in Table 2.

Table 2. Calculation of Learning Motivation

Class	Number of Sample	Standard Deviation	Average Value	Effect Size	Conclusion
Experi mental	30	6.32637	60.89	0.46	Medium Influence
Control	30	5.10348	56.57		

From the calculation of the influence test using the Effect Size test, the ES value = 0.46. According to the interpretation classification of effect size, the effect is classified as medium. So, it can be concluded that this research has a medium influence on the motivation to learn science.

The research was carried out in the experimental class, namely class V-D using a blended learning model assisted by video animation. In learning in the experimental class using a blended learning model assisted by animated video consisting of 2 phases. Phase 1, learning is carried out online through Zoom Meeting. Teachers provide learning materials on the meaning of the water cycle, its benefits, and the types of water cycle assisted by animated videos. At the beginning of the lesson, the teacher gives a little repetition regarding the water cycle material they have learned before. After that, the teacher played an animated video about the water cycle, students paid attention to the video. After the video finished playing, the teacher asked some questions regarding the content of the video. Then if all students have understood, the learning is closed and students are given the task of re-watching the animated video to understand the material. Furthermore, in phase 2 learning about the water cycle material is continued at the next meeting with offline or face-to-face learning. The stages carried out are the same as when discussing online learning. It's just that during face-to-face learning, students seem to be more enthusiastic. After completing the learning, a questionnaire regarding the motivation to learn science for students is given to be filled in according to the student's statement. For questions to test student learning outcomes, it is given in the form of a Google Forms link which is distributed through the Whatsapp Group and given a deadline of 2 days for the work.

And in the control class, namely class V-C also using a blended learning model with 2 phases too but only using Power Point. Meetings in each class group are held twice a week, offline and online meetings. Because of blended learning, there are learning materials that are given directly and through Whatsapp groups and to test learning outcomes using google forms to find out students' science learning outcomes. During the learning activities, the abilities and skills of students are more visible in the experimental class, because this class uses animated video learning media so that students are more enthusiastic to take part in learning activities.

With the increase in learning motivation in students, automatically student learning outcomes will increase then learning can also be said to be effective. Previous research stated that learning was carried out directly will motivate students because of the direct interaction between teachers with its students (Wulandari et al., 2021). From (Sjukur, 2013) research, the results was also that there were differences in learning motivation between the students who were taught blended learning compared to students taught conventional learning with value Sig. 0.012 with an average of 4.74 and there is a difference in learning outcomes with sig scores. 0,000 with an average of 13.39. According to (Weniati, 2022) blended learning model can increase student attraction and motivation during the implementation of face-to-face learning and suitable for use in the 21st era. This is because blended learning can help the development of increasingly broad and sophisticated technology. This blended learning also helps teachers prepare their students with a learning style that is different from before and helps them in dealing with challenges in the future. Student learning motivation will be built if the learning process is packed with interesting and creative by the teacher, so students do not feel bored and can be more easy in understanding the material taught. In this case the importance of a teacher in choosing a media proper learning during online learning. Even though learning is carried out online, the learning process must still be making the student an active object during learning. For example using learning media with animated videos (Juliya & Herlambang, 2021).

Science Learning Outcomes Variabel

The frequency distribution of the experimental class students' science learning outcomes can be graphed histograms and polygons in the following figure:

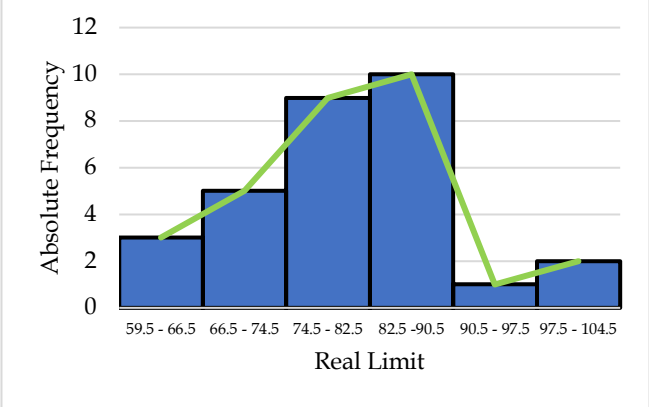

Figure 2. Histogram and Polygon Graphs of Science Learning Outcomes of Experimental Class

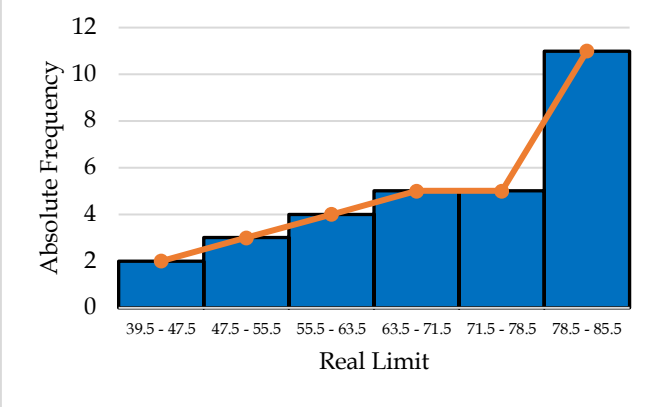

Figure 3. Histogram and Polygon Graphs of Science Learning Outcomes of Control Class

From the histogram and polygon graphs of science learning outcomes of experimental class students above, it can be seen that most of the students obtained science scores in the class interval of 82.5 – 90.5 as many as 10 students with a size of 33.33%. The highest score is in the range of 97.5 - 104.5 as many as 2 students with a percentage in the form of 6.67%. While the lowest score lies in the range of 59.5 – 66.5 as many as 3 students or by 10%.

From the histogram and polygon graphs of science learning outcomes for control class students above, it can be seen that most of the students obtained science scores in the class interval 78.5 – 85.5 as many as 11 students in percent, namely 36.67%. The highest score is in the same place in the range of 78.5 – 85.5 as much as 11 in the percentage of 36.67%. While the lowest score lies in the range of 39.5 – 47.5 as many as 2 students or 6.67%.

The average overall results suggest that research-based, best teacher practices from traditional classrooms are actually likely, candidates for best teacher practices also in blended learning classrooms. This conclusion is relevant in the field of blended learning, where there is about technology and innovation of the teacher. In addition, these results suggest that the tool was developed for the study, it can be used to observe and evaluate teaching instructions practices relevant to teachers when used the blended learning model (Anthony, 2019).

After calculating the data of each group of classes, the experimental and control class learning outcomes were tested using the normality test with the results of the data being normally distributed as shown in table 3 below.

Table 3. Normality Test Results

Class	Number of Sample	Significance Level	L_{count}	L_{table}	Conclusion
Experimental	30	0.050	0.102	0.161	Normal Distribution
Control	30		0.133	0.161	

Based on the calculation results of the table above for the experimental class it is $L_0 = 0.102$ with n = 30 and the significance level of $\alpha = 0.05$ or 5%. Since $L_{count} = 0.102 < L_{table} = 0.161$, and from the control class it is $L_0 = 0.102$ with n = 30 and the significance level of $\alpha = 0.05$ or 5%. Since $L_{count} = 0.102 < L_{table} = 0.161$. The accepted H_0 can be concluded that the experimental class and control class sample came from a normally distributed population.

Table 4. Homogeneity Test Results

Class	Number of Sample	s^2	F_{count}	F_{table}	Conclusion
Experimental	30	100.689	1.684	1.861	Homogeneous
Control	30	169.569			

Furthermore, Fisher's test was carried out as a homogeneity test and obtained $F_{count} = 1.6839$ and from the F distribution list with a significance level of = 0.05, $F_{(0.05(29.29))} = 1.8608$ was obtained. Because $F_{count} = 1.6839 < 1.8608 = F_{table}$, it can be concluded that H_0 is accepted. Thus, the data for the two classes have the same large variance, meaning that the two classes are homogeneous. From the results of the analysis prerequisite test which includes the normality test and the homogeneity test, it is known that the two classes are in a normal and homogeneous distribution, so that it can be continued with the research hypothesis test using the t-test and the effect size.

Based on the analysis calculation obtained t_{count} = 3.3637 > t_{table} = 1.6697 then H_0 is rejected at the significance level = 0.05. With the rejection of H_0, it can be concluded that there is an influence in the use of blended learning models assisted by animated videos on the science learning outcomes of fifth grade students of Cilangkap 01 Pagi elementary school.

Table 5. Calculation of Learning Outcomes (Effect Size)

Class	Number of Sample	Standard Deviation	Average Value	Effect Size	Conclusion
Experimental	30	100.689	81.00	0.806	High Influence
Control	30	169.569	70.50		

From the calculation of the influence test using the Effect Size test, it is obtained. The ES value = 0.8063 according to the interpretation classification, the effect is classified as high. So it can be concluded that this research has a relatively high influence on science learning outcomes.

According to (Allen et al., 2007), blended learning is very well used due to blended learning contains a proportion between 30 and 79 percent of online content delivery that should be done online rather than in the traditional learning. Blended learning has the benefits of hands-on learning, as well as independent and independent learning. In curricular blended learning approach, students have hands-on experience with the content and take ownership of their learning (Seage & Türegün, 2020). Benefits obtained by students by applying a learning model blended learning assisted by video can interest in learning, improving student learning outcomes, increase knowledge and experience for students to open up new horizons, and hopefully to applied in environmental life schools as well as in the community (Hendarita, 2021).

Blended learning does help improve student learning achievement in science and technology. However, not all participants benefit from it, some students can thrive during blended learning (Hwang et al., 2019). Blended learning can be implemented in dynamics, this imperative in response to necessary and effective improvements that the power of technology to bring about positive change in the way teacher teach and learn in schools and classrooms, and this can have a positive impact on student learning outcomes (Yeigh et al., 2021).

Conclusion

Based on the research that has been done, it is concluded that there is a relatively high influence on science learning outcomes and there is a medium influence on science learning motivation by using a blended learning model assisted by animated videos in science subjects for class V water cycle material. So, this animated video learning media can be used and is classified as important media to use when blended learning as a variation of learning media.

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