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Fun Simple Style and Airplane Science Teaching to Digital-Based Elementary School Students

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ABSTRACTS

The study aimed to analyze the simple teaching style and aircraft of definitions, types, and benefits using digital-based learning methods to elementary school students. The study was conducted on 31 elementary school students in Cirebon City, Indonesia, using PowerPoint media in the form of images made as attractive as possible by conventional teaching methods. The learning process is done online using google meet media. The understanding and success of the student learning process are evaluated by filling in 20 pre-test-post-test questions. The results showed that many students experienced a decrease in post-test grades but not a few experienced an increase. This shows that many students have a level of rigor that is less in some tests whose questions are aimed at trapping students. The main reason for the lack of success of the teaching process is the lack of student focus on the learning process where the teaching process using conventional methods makes students active and not feel bored during teaching, but the post-test results are inversely proportional to the reality during the learning process. Therefore, this learning method is interesting where the child looks easy to answer questions but students need good concentration during the learning process. That way, the media used must use concrete and more unique teaching methods to attract their focus so that it is not easily disturbed.

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1. INTRODUCTION

Teaching is two activities consisting of teaching and learning. Teaching is done to students to make them understand the material or teaching materials that will be delivered by the teacher. Teaching can be done to anyone, including elementary school students. The elementary school stage is the most important period for students because students are in an active period, where they prefer to explore, love to seek, or experience first-hand something new for them. They tend to be more curious. However, during the current pandemic, all activities are limited to avoid the spread of covid 19. Therefore, the teaching that was originally held directly has turned into digital-based teaching. Now, we cannot be separated from the digital name, especially in the field of education. Students are required to use digital-based learning such as google meet, zoom meeting, and so on (Riyanto *et al.*, 2021).

Students can search for teaching materials or subject matter that supports their education through the internet such as e-books and so on. One of the subjects in the field of teaching elementary school students is style and simple planes. The style itself is something that cannot be seen, but its influence can be felt. A force can change the direction of an object and the speed of an object. There are many kinds of forces in everyday life, including the force of gravity, friction, magnetic force, and so on. While simple aircraft are used by humans to facilitate human work. The lever is one of the most widely used simple machines, including scissors, pliers, carts, and others. Not only that, pulleys, inclined planes, and axle wheels are also simple machines.

Many papers discuss simple forces and planes. Asmawati and Kejora (2020) discuss simple aircraft concrete media can increase the conceptual mastery of elementary school students with inquiry-based science learning. However, there needs to be a learning plan. Then Fatonah and Assingkily (2020) discussed simply to force and plane science materials that are useful in the current era, especially for elementary school students. Octafiana *et al.* (2018) discuss simple airplane material using interactive media that gets a good response so that this media can increase student motivation and learning outcomes. Suyanto (2018) discusses the material of simple forces and planes by applying the snow throwing learning model which can increase students' motivation and learning outcomes. This study did not have any significant difficulties. Therefore, analyzing the teaching of simple forces and planes starting from the definition, types, and benefits is the aim of this research. This research was conducted using a digital-based conversion method to 31 elementary school students in Cirebon City, Indonesia, in the form of PowerPoint. The learning process is carried out through Google Meet. Before holding a meeting, students first filled out 20 pre-tests to measure their initial knowledge. After that, students carry out learning activities about simple forces and planes.

The novelty of this research is:

(i) Simple force and plane are materials that are simple and easy to understand for elementary school students.
(ii) Learning is done online with fun activities for students.
(iii) Encouraging students to explore more or not only in terms of what has been learned.

The students' success and understanding were evaluated by post-test, where the questions were made the same as the pre-test. The results of the post-test showed that there was a decrease in grades for some students but not a few who experienced an increase. From the test results, it can also be seen that some students have a low level of accuracy because there are questions that are intended to trap students. The questions were made so that students read more carefully and at the same time improve their literacy, as evidenced by 61% of the

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topics that the students did not understand. The main reason for the unsuccessful teaching process is the students' lack of focus during teaching and their activeness in asking questions about material they have not understood.

2. METHODS

The learning methods used in this study are digital-based learning methods for elementary school students. The study, conducted on 31 elementary school students in Cirebon City, Indonesia, used PowerPoint media in the form of images made as attractive as possible with conventional teaching methods. Students are required to listen, dare to ask and answer questions given, and discuss together. This learning process is done online using google meet media. The understanding and success of the student learning process are evaluated by filling in 20 pre-test-post-test questions. At the beginning of learning, students are given a pre-test in the form of google form to measure the student's initial knowledge. After students do learning activities, students are given the problem back (post-test) in the same form. The pre-test and post-test questions are shown in **Table 1.**

Table 1. About Pre-test-Post-test.

No.	Pre-test	Post-test
1	Have you ever known or heard of "simple styles and planes"?	Have you ever known or heard of "simple styles and planes"?
2	Is it true that style is visible?	Style is...
3	Does force cause an object to move?	Does force cause an object to move?
4	Are gravitational forces, frictions, and magnetic forces all sorts of forces?	Below are all styles, except...
5	Is it true that if we are in a vacuum, we seem to not weigh so we will hover?	When a 100 kg human is on the moon, what will happen is...
6	Is it true that marble A will be more difficult to roll in a place where the surface is smooth/slippery compared to a place where the surface is rough/uneven?	Is it true that marble A will be more difficult to roll in a place where the surface is smooth/slippery compared to a place where the surface is rough/uneven?
7	Is it true that the outside of the car tire is not made smooth (slippery) so that the friction force is large so as not to endanger the safety of its passengers?	In order not to endanger the safety of passengers, the outside of the vehicle tire is made... to...
8	Is a horse magnet a type of magnet?	Ladam magnets are a type of magnet called...
9	Are aluminum and zinc magnetic objects that can be pulled by magnets?	Aluminum and zinc are...
10	Is it true that magnetic forces cannot penetrate objects such as cardboard?	Is it true that magnetic forces cannot penetrate objects such as cardboard?
11	Is it true that the two poles on a similar magnet (U-U) would resist?	The properties of magnetism are... (Answer more than 1)
12	Can we make artificial magnets by rubbing magnetic materials with a magnet?	Can we make artificial magnets by rubbing magnetic materials with a magnet?
13	Simple planes help facilitate human work, one of which is a lever. The simplest lever is the lever. Is it true that scissors and pliers are examples of levers?	Simple planes help facilitate human work, one of which is a lever. The simplest lever is the lever. Scissors and pliers are examples of type levers...
14	Is it true that the disadvantage of using this tilted field is that the distance becomes far away?	The disadvantages of using a tilted field are...

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Table 1 (Continue). About Pre-test-Post-test.

No.	Pre-test	Post-test
15	Is a free pulley one of those simple planes that do not change its position when moving objects?	Is a free pulley one of those simple planes that do not change its position when moving objects?
16	Is it true that the type of magnet used in a compass is a needle magnet?	Needle magnets are used on...
17	Is it true that the person pushing the sandbar is an example of the second type of lever so that is the load - the fulcrum - power?	Is it true that the person pushing the sandbar is an example of the second type of lever so that is the load - the fulcrum - power?
18	A magnetic object is an object that can be pulled by a magnet. Is it a magnetic object called ferromagnetic?	Magnetic objects are also called objects...
19	Is it true that objects made from the material of nails can magnify the friction force?	Is it true that objects made from the material of nails can magnify the friction force?
20	Is it true that drawing water in wells is included in examples of the use of simple aircraft in everyday life?	Examples of simple airplane use in everyday life, except...

3. RESULTS AND DISCUSSION

Figure 1 shows the pre-test and post-test results of 31 elementary school students tested. Students are said to be good in early pre-test knowledge of simple styles and aircraft with an average of 76.77 out of 100 points. While the average score of post-test students has an average of 67.1 out of 100 points. This indicates a decrease in the pre-test-post-test results of students where students who score below 70 are more in post-test results.

If you look at **Figure 1**, the pre-test results shown in blue show that 10 students get the highest score of 75. While the post-test results shown in red showed that 5 students got the highest score of 70.

In the pre-test results, there is 1 person who gets the smallest value of 50, as well as the value of 55-60. Then for the grade of 70, 5 students get the grade and it has been said to be quite good. Then 2 students get a grade of 80. Above that, a score of 85 is obtained by 5 students. 3 students get a grade of 90 and following above, there is 1 student who gets a score of 95 and 100, respectively.

In the post-test results, there is 1 person who gets the smallest value of 20, as well as the values 30 and 40. Then for grades 45 and 60, 2 students get each of these grades and are still said to be less good. Then there is one student who gets a grade of 50. Above, grades 55, 65, 75, and 95 are obtained by each of 3 students. 5 students get a score of 70 and following above, 4 students get a score of 80. For the highest score of 100 obtained by 1 student, as well as the value of 90 there is only 1 student who gets the grade.

After being examined one by one, both pre-test and post-test results through a google form obtained research results that showed that there were students who experienced a 25.8% increase in grades against their pre-test-post-test grades, then students who experienced a decrease in pre-test-post-test grades by 61.3%, and there were also students who did not experience a decrease or increase in grades as much as 12.9%.

For students who do not experience a decrease or increase in grades means that the grades obtained by the student do not change, where the possibility of students understanding the material and not understanding the material cannot be detected or invisible because the pre-test and post-test results tend to be stable.

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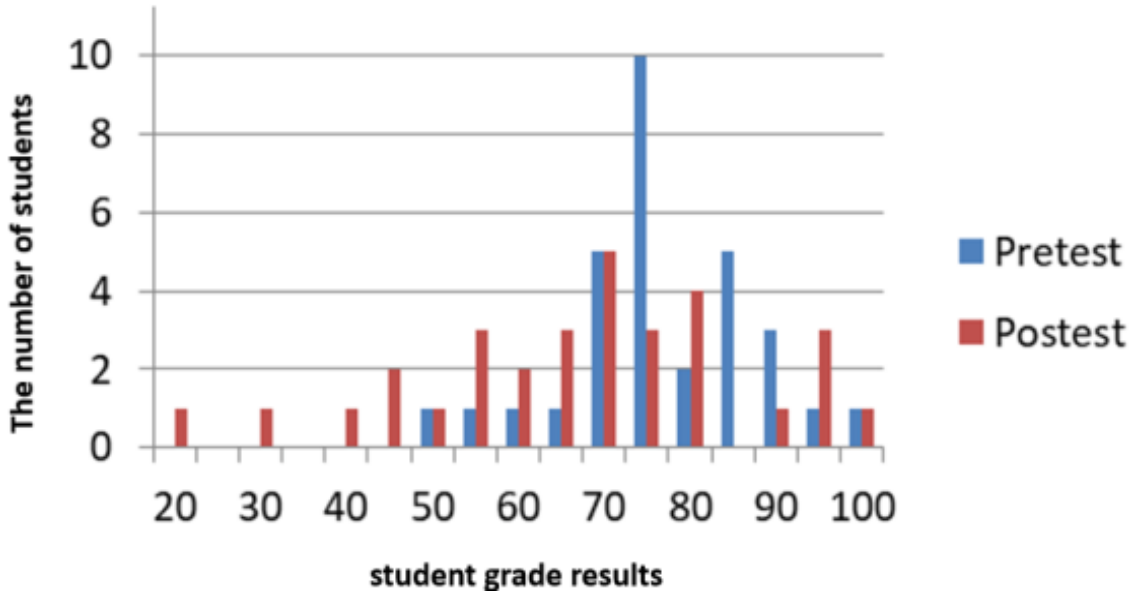

Figure 1. Student grade average results diagram.

The elementary school children's period is an intellectual period, during which they have begun to adjust to problem-solving and are also beginning to show new abilities (Riyanto *et al.*, 2021). Their knowledge will also continue to grow according to their curiosity. However, elementary school students are still in a period of development where it is unlikely that all things will be received properly.

This study found the reason why it can happen something as shown in the results of this study. A very logical reason is that students experience confusion with post-test questions that are slightly different from pre-test questions where there are many questions whose sentences change but are still in the same context. As for the results as below:

(i) For the number 1 pre-test-post-test question of "Have you ever known or heard the material about "simple styles and planes"?", the results did not decrease or increase. This is because the form of the problem is only to know the initial knowledge of the student.

(ii) For question number 2 pre-tests on "Is it true that style is something visible?" and post-test about "Style is...", the results have increased. This is because students have received material about understanding style through the learning process and they focus on learning.

(iii) For question number 3 pre-tests on "Does force cause an object to move?" and post-test about "Does force cause an object to move?", the result decreases. This is due to the lack of thoroughness of students in reading the given questions and the problem is trapping to measure the student's focus.

(iv) For the number 4 pre-test question of "Are gravitational forces, frictions, and magnetic forces all sorts of forces?" and the post-test about "Below are all styles, except...", the result decreases. This is due to the lack of thoroughness of students in reading the given questions and the problem is trapping to measure the student's focus.

(v) For the number 5 pre-test question of "Is it true that if we are in a vacuum, we seem to not weigh so we will hover?" and the post-test about "When a 100 kg human is on the moon, what will happen is...", the result decreases. This is due to the lack of thoroughness of students in reading the given questions and the problem is trapping to measure the student's focus.

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(vi) For the number 6 pre-test-post-test question of "Is it true that marble A will be more difficult to roll in a place where the surface is smooth/slippery compared to a place where the surface is rough/uneven?", the result decreases. This is due to the lack of thoroughness of students in reading the given questions and the problem is trapping to measure the student's focus.

(vii) For the number 7 pre-test question of "Is it true that the outside of the car tire is not made smooth (slippery) so that the friction force is large so as not to endanger the safety of its passengers?" and the post-test about "In order not to endanger the safety of passengers, the outside of the vehicle tire is made... to...", the result decreases. This is due to the lack of thoroughness of students in reading the given questions and the problem is trapping to measure the student's focus.

(viii) For the number 8 pre-test question of "Is the horse-horseshoe magnet one type of magnet?" and the post-test about "Magnet ladam is one type of magnet called...", the result decreases. This is due to the lack of thoroughness of students in reading the given questions and the problem is trapping to measure the student's focus.

(ix) For the number 9 pre-test question of "Are aluminum and zinc magnetic objects that can be pulled by magnets?" and the post-test about "Aluminium and zinc are...", the result decreases. This is due to the lack of thoroughness of students in reading the given questions and the problem is trapping to measure the student's focus.

(x) For question number 10 pre-test-post-test question of "Is it true that magnetic forces cannot penetrate objects such as cardboard?", the results have increased. This is because students have received material about understanding style through the learning process and they focus on learning.

(xi) For the number 11 pre-test question of "Is it true that the two poles on a similar magnet (U-U) would resist?" and the post-test about "The properties of magnetism are... (Answer more than 1)", the result decreases. This is due to the lack of thoroughness of students in reading the given questions and the problem is trapping to measure the student's focus.

(xii) For question number 12 pre-test-post-test question of "Can we really make artificial magnets by rubbing magnetic materials with a magnet?", the results have increased. This is because students have received material about understanding style through the learning process and they focus on learning.

(xiii) For the number 13 pre-test question of "Simple planes help facilitate human work, one of which is a lever. The simplest lever is the lever. Is it true that scissors and pliers are examples of levers?" and the post-test about "Simple planes help facilitate human work, one of which is a lever. The simplest lever is the lever. Scissors and pliers are examples of type levers...", the result decreases. This is due to the lack of thoroughness of students in reading the given questions and the problem is trapping to measure the student's focus.

(xiv) For question number 14 pre-tests on "Is it true that the disadvantage of using this tilted field is that the distance becomes far away?" and post-test about "The disadvantages of using a tilted field are...", the results have increased. This is because students have received material about understanding style through the learning process and they focus on learning.

(xv) For question number 15 pre-tests on "Is a free pulley one of those simple planes that do not change its position when moving objects?" and post-test about "Is a free pulley one of those simple planes that do not change its position when moving objects?", the

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results have increased. This is because students have received material about understanding style through the learning process and they focus on learning.

(xvi) For the number 16 pre-test question of "Is it true that the type of magnet used in a compass is a needle magnet?" and the post-test about "Needle magnets are used on...", the result decreases. This is due to the lack of thoroughness of students in reading the given questions and the problem is trapping to measure the student's focus.

(xvii) For question number 17 pre-test-post-test question of "Is it true that the person pushing the sandbar is an example of the second type of lever so that is the load - the fulcrum - power?", the results have increased. This is because students have received material about understanding style through the learning process and they focus on learning.

(xviii) For the number 18 pre-test question of "A magnetic object is an object that can be pulled by a magnet. Is it a magnetic object called a ferromagnetic?" and the post-test about "Magnetic objects are also called objects...", the result decreases. This is due to the lack of thoroughness of students in reading the given questions and the problem is trapping to measure the student's focus.

(xix) For the number 19 pre-test-post-test question of "Is it true that objects made from the material of nails can magnify the friction force?", the result decreases. This is due to the lack of thoroughness of students in reading the given questions and the problem is trapping to measure the student's focus.

(xx) For question number 20 pre-tests on "Is it true that draw water in wells is included in examples of the use of simple aircraft in everyday life?" and post-test about "Examples of simple airplane uses in everyday life, except...", the results have increased. This is because students have received material about understanding style through the learning process and they focus on learning.

That way, some of the post-test questions given intend to train elementary school students' literacy in reading skills. The main reason for the lack of continuity of this teaching process is the lack of student focus where the teaching process using conventional methods makes students much more active and not easily bored, but the results are inversely proportional to the reality at the time of the learning process.

4. CONCLUSION

Teaching science about simple forces and planes using digital-based learning methods with google meet to 31 elementary school students showed quite good results. Students' understanding of the learning process is very good which is then evaluated in the form of pre-test-post-test showing various results, some students experience a decrease and also students who experience an increase. If the average score of students is compared between the results of the pre-test and post-test, it can be seen that the average score of students is reduced or has decreased. Factors that may affect students are an inefficient learning process and a lack of student focus on learning materials. This factor needs to be supported by methods that are suitable for digital-based learning and interesting media for students so that students are active and do not feel bored during learning. That way, the method affects the success of student learning. The method used must be a concrete and attractive teaching method for students so that they focus during the learning process.

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6. AUTHORS' NOTE

The authors declare that there is no conflict of interest regarding the publication of this article. The authors confirmed that the paper was free of plagiarism.

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