



## Video Intervention in Statistics Learning as a Strategy to Increase Mathematics Learning Outcomes

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Article Info	Abstract
<i>Submitted</i> : 21 – 05 – 2021 <i>Revised</i> : 07 – 06 – 2021 <i>Accepted</i> : 09 – 06 – 2021 <i>Published</i> : 15 – 06 – 2021	The COVID-19 pandemic requires the learning process to take place online, this has an impact on teachers who are required to creatively innovate unusual learning processes. This research aims to determine the difference in the average learning outcomes of students during online learning between the application of learning videos before and after receiving the learning video intervention treatment. The research instrument used was a test of statistics material. The learning outcomes test data obtained were processed by paired t-test. This research found that there was a difference in the average learning outcomes of students before and after the application of learning videos. The application of learning videos provides better learning outcomes than before using learning videos.

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### Introduction

In fact, education is a system consisting of several components including: students, educators, goals, tools, learning processes and interrelated environments (Hartadi, Dewantoro, and Junaidi 2020). Learning is one of the activities in the classroom that involves teachers and students assisted by media, tools, methods, and materials, designed to achieve educational goals (Pane and Dasopang 2017; Syarifudin 2020). The learning comfort zone that had been going on had to change with the emergence of the COVID-19 pandemic. The learning process that takes place must be done online (in the network) (Rachmat and Krisnadi 2020).

Based on preliminary studies on several related parties, both teachers and principals of SMP Negeri 2 Bandar Lampung, the information was obtained that students' mathematics learning outcomes were still not optimal in this online learning process, especially on the statistics subject. This is because students still have the notion that mathematics lessons are less fun, stiff, and scary. The information is also obtained based on data from daily tests on statistics subject when online learning takes place, the average percentage of student completeness is 70%, this condition has not reached the specified Minimum Completeness Criteria (KKM) which is 76.

Low motivation allegedly caused by learning techniques that changed drastically with the use of ICT so that many teachers have not mastered these learning techniques, then limitations in terms of tools to support online learning for both educators and students, and the duration of online learning is relatively long so that students get bored quickly because they have to stare at the screen for hours. The condition of online learning makes it difficult for teachers to control and maintain the learning atmosphere because it is limited to virtual spaces (Cahyani, Listiana, and Larasati 2020). The learning atmosphere created during online learning also affects students' learning motivation, if in offline learning the teacher is able to create a conducive classroom atmosphere to maintain students' learning motivation so that learning can be achieved because

the classroom atmosphere has a significant influence on learning motivation (Sari and Deskoni 2018). This condition has an impact on the low learning outcomes of students.

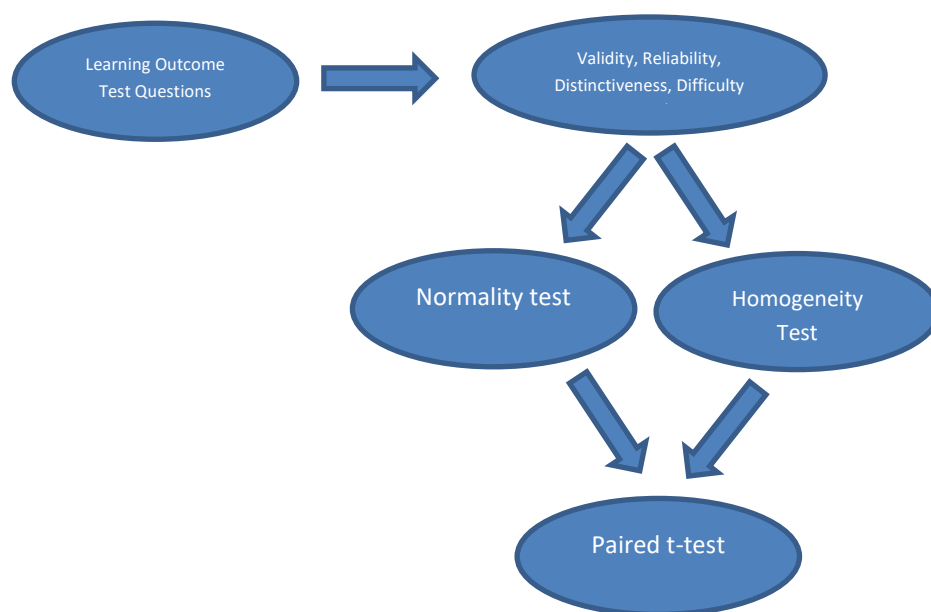
The thing that needs to be done to overcome this problem is the need of the creativity of mathematics teachers to develop the learning, both in terms of methods and media used to improve student learning outcomes in the online learning process. Online learning is a learning that takes place in a network where teachers and students do not meet face to face (Pohan 2020). Online learning is considered by the government as a solution to ensure the continuity of the learning process from elementary school to university so that it can continue (Arizona, Abidin, and Rumansyah 2020). Online learning has an influence on student achievements (Nugraha, Sudiatmi, and Suswandari 2020; Subur and Rista 2020). In this research, the application used is the Whatsapp application.

The WhatsApp application is able to accommodate the implementation of the learning process well. Several researches have stated that this application is a good solution in the implementation of the online learning process (Agustin 2020; Bhagaskara, Afifah, and Putra 2021; Jumi atmoko 2016; Pustikayasa 2019). This application is an application that is often used by all smartphone users, making the learning process easier to access. The WhatsApp application has features that support it to become a support media in the teaching and learning process and also help to make the teacher's work easier (Iskandar 2020). The Whatsapp Group feature is part of the Whatsapp application that can easily reach many people quickly (Saragih and Ansi 2020; Yensy 2020). One of the media that can be easily spread in Whatsapp Group is video.

The learning video can be used as learning media wherever and whenever according to user needs. The learning video is one type of media to achieve learning objectives that prioritize the power of sound, images and moving animations (Khairani, Sutisna, and Suyanto 2019; Nuritha and Tsurayya 2021; Pamungkas et al. 2018). Educators can easily create an explanation display of an interesting material in a learning video. Several relevant researches on the application of learning videos give positive results. Iwantara, Sadia, and Suma (2014) stated that learning videos increase students' motivation and concepts understanding. The application of learning videos can also improve student learning achievement (Busyaeri, Udin, and Zaenudin 2016; Yunita and Wijayanti 2017, 2017). The difference that researchers provide in this research is the combination of the use of Whatsapp Groups and learning videos during the COVID-19 pandemic on students' mathematics learning outcomes.

### **The Research Methods**

This research is a quantitative research with pre-experimental method and one group pretest-posttest research design. This research was conducted in the 8th grade of SMP Negeri 2 Bandar Lampung in the even semester of the 2020-2021 school year. The population of this research was class 8<sub>1</sub> to 8<sub>10</sub> with the sampling technique used was cluster random sampling so that 2 groups of class samples were selected, namely class 8<sub>1</sub> as the experimental class and 8<sub>2</sub> as the control class. The research instrument used in this research was a test of student learning outcomes on the statistics subject, which consisted of 5 questions. Data analysis in this research used paired t-test, provided that the data came from a normally distributed and homogeneous population. Here is a flow chart of this research:



**Figure 1. Research Method Flow Chart**

### The Results of the Research and the Discussion

The results of this research focus on two aspects, namely online learning using the Whatsapp Group before using the learning video intervention and the whatsapp group after using the learning video intervention. Online learning was carried out in the 8<sup>th</sup> grade of SMP Negeri 2 Bandar Lampung on the statistics material with the activity of giving a description test of 5 questions before a learning video intervention (pretest) was distributed through the WhatsApp group. It can be seen in table 1 below:

**Table 1. Online Learning Outcome Data Using Whatsapp Group Before the Learning Video Intervention**

Study Results Before Intervention	
Valid N	31
Minimum	10
Maximum	67
Mean	45.29
Std.Deviation	16.01

The value obtained is the result of the five answers to the description test questions in which each question number has different points. The value obtained from the pretest before being given the learning video intervention treatment, namely the lowest value is 10 and the highest value is 67 with the average value obtained is 45.29 and the standard deviation is 16.01. It shows that the results of online learning using Whatsapp Groups before being given the learning video intervention treatment needs more attention so that learning outcomes increase by providing learning video interventions in online learning using Whatsapp Groups which are carried out during the current COVID-19 pandemic.

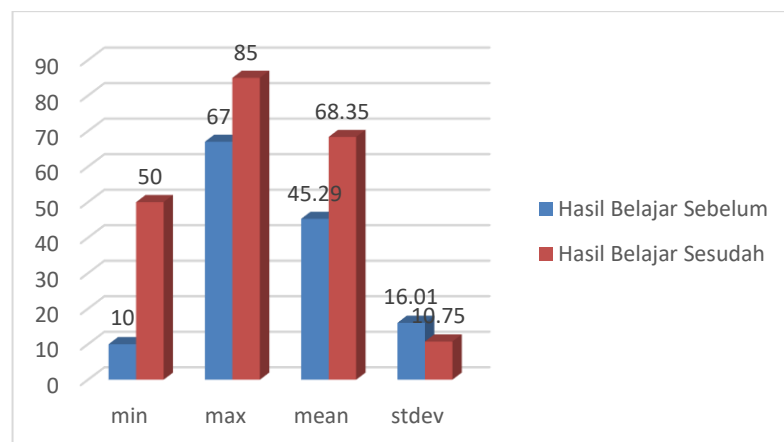
Online learning using whatsapp groups after being given the learning video intervention treatment on 8<sup>th</sup> grade students of SMP Negeri 2 Bandar Lampung on statistics material is carried

out by giving a description test of 5 questions after a learning video intervention (posttest) which is distributed via whatsapp group can be seen in table 2 below.

**Table 2. Online Learning Outcome Data Using Whatsapp Group After the Learning Video Intervention**

Study Results After Intervention	
Valid N	31
Minimum	50
Maximum	85
Mean	68.35
Std.Deviation	10.75

The 8<sup>th</sup> grade students' knowledge of statistics material after being given learning video intervention treatment that were shared via whatsapp groups. The results were obtained from the posttest after being given the learning video intervention treatment, the minimum score obtained was 50, the maximum score obtained was 85, the average score obtained was 68.35, and the standard deviation obtained was 10.75. Based on these data, the average results of online learning using whatsapp groups with the learning video intervention treatment were successful and able to improve student learning outcomes. Comparison of online learning outcomes using whatsapp groups before and after being given the learning video intervention treatment can be seen in Figure 2:



**Figure 2. Learning Outcome Data Before and After Learning Video Intervention**

Based on Figure 2, it is known that the minimum, maximum, and average learning outcomes of students with online learning using WhatsApp groups after being given the learning video intervention treatment are better than the learning outcomes of students with online learning using WhatsApp groups before being given the learning video intervention treatment. The standard deviation value in the pre-treatment group have a much greater value than the standard deviation in the post-treatment group. This is because the size of the data spread around the average in the pre-treatment data is greater than the post-treatment data.

Furthermore, the data processing of the Kolmogorov-Smirnov normality test was carried out using SPSS 20 in the data group before and after the learning video intervention treatment. The results of the data processing can be seen in Table 3 below:

**Table 3. The Results of Kolmogorov-Smirnov Normality Test**

Treatment	Significance Value of K-S Test Results	Significance Value (p)	Conclusion
Before	0.2	0.05	Because $0.2 > 0.05$ , the data is normally distributed.
After	0.2		Because $0.2 > 0.05$ , the data is normally distributed.

Based on Table 3 above, the data can be proven to be normally distributed. Next, a paired t-test was conducted to prove that there was a difference in the average learning outcomes between online learning using WhatsApp groups without learning video intervention treatment and online learning outcomes using WhatsApp groups with learning video intervention treatment. The following table shows the results of paired t-test using SPSS 20:

**Table 4. Paired t-Test Results**

	T	Df	Sig. (2-tailed)
Pair 1 before-after	-7.736	30	0.00

The results of the paired t-test in table 4 show that the acquisition of Sig. (2-tailed) is 0.00, this means the value of Sig. (2-tailed)  $0.00 < 0.05$ , then  $H_0$  is rejected and  $H_a$  is accepted. This shows that there is a difference in the average learning outcomes between online learning using whatsapp groups without learning video intervention treatment and online learning outcomes using WhatsApp groups with learning video intervention treatment. In addition, it can be shown that the  $t_{calculate} = -7.736$ . The t-calculate value is negative because the average value of learning outcomes in online learning using WhatsApp groups without the learning video intervention treatment is lower than the average value of online learning outcomes using WhatsApp groups with the learning video intervention treatment. However, a negative t-calculate value can be positive, namely t-calculate = 7.736 and with the value of  $\alpha = 5\%$ , the value of  $t_{table} = t_{0.025;30} = 2.042$  because  $7.736 > 2.042$ , it means that  $t_{calculate} > t_{table}$ , so  $H_0$  is rejected and  $H_a$  is accepted, which means that there is a difference in average learning outcomes between online learning using WhatsApp groups without the learning video intervention treatment and online learning using WhatsApp groups with the learning video intervention treatment. The difference in the average learning outcomes can also be shown from the results of descriptive statistics with the acquisition of the average score of online learning outcomes using WhatsApp groups without the learning video intervention treatment on statistics material is 45.29, while the acquisition of the average score of online learning outcomes using WhatsApp group with the learning video intervention treatment on statistics material is 68.35. This means that online learning using WhatsApp groups with the learning video intervention treatment on statistics material is better in improving the mathematics learning outcomes for 8th grade students of SMP Negeri 2 Bandar Lampung during the COVID-19 Pandemic.

The results of this research complement several previous studies, Saragih and Ansi (2020) found that there was an effectiveness of learning using WhatsApp groups during the COVID-19

pandemic. Student motivation and learning outcomes after being treated using WhatsApp groups are higher than student learning outcomes before being treated using WhatsApp groups (Indaryani and Suliworo 2018; Nugraha et al. 2020; Yensy 2020). In addition, the results of the research from Wahyuni (2018) stated that the results of her research show that WhatsApp has features that support it to become a support media in the teaching and learning process. WhatsApp also helps facilitate the work of teachers. Other discoveries suggest that WhatsApp groups with the Group Discussion By Whatsapp type II learning model are effective in increasing student learning independence because students are very familiar in using WhatsApp groups, and the learning model applied to online learning through WhatsApp group media encourages every student to be active in participate/discuss (Susilowati 2020). The application of WhatsApp groups combined with learning videos is one of the educators' efforts to overcome today's online learning.

### Conclusion and Suggestion

Based on the data analysis and the discussion, it can be concluded that online learning using WhatsApp group media with the learning video intervention treatment provides better learning outcomes than using only WhatsApp group media. The results of this research are one of the alternatives offered in the implementation of online learning during the COVID-19 pandemic.

Based on the results of this research, suggestions that can be given are that the implementation of online learning during the pandemic using the WhatsApp application media and collaborating with the use of video as a learning media can be carried out and developed further. This is an alternative solution to problems that arise during the implementation of online learning. For further researchers, they can create a more interactive learning video for students.

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