



The Effect of Learning Videos on Problem Solving Ability in Chemistry Learning through Google Classroom At SMAS Muhammadiyah Maumere

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Abstract: The Effect Of Learning Videos On Problem Solving Ability In Chemistry Learning Through Google Classroom At Muhammadiyah Maumere SMAS. The COVID-19 outbreak has caused various negative effects, one of which is in the field of education. Schools in Indonesia implements an online learning system because it is to suppress the spread of the COVID-19 virus. This study aims to determine the effect of learning videos on students' problem solving abilities. The sample in this study were 19 students of class XI MIPA. The sampling technique used is a non-probability sampling technique, especially the saturated sampling technique. This research uses descriptive quantitative method. The results of this study are the results that learning videos have an influence on the problem solving ability of chemistry learning through google classroom at SMAS Muhammadiyah, this is based on the results of the t test.

Keywords: Learning Video, Problem Solving Ability, Google Classroom

Abstrak: Pengaruh Video Pembelajaran Terhadap Kemampuan Pemecahan Masalah Pembelajaran Kimia Melalui Google Classroom Di SMAS Muhammadiyah Maumere. Wabah covid 19 telah menyebabkan berbagai efek negative salah satunya dalam bidang pendidikan. Sekolah-sekolah di indonesia menerapkan system pembelajaran online karena untuk menekan penyebaran virus covid 19. Penelitian ini bertujuan untuk mengetahui pengaruh video pembelajaran terhadap kemampuan pemecahan masalah peserta didik. Sampel dalam penelitian ini adalah peserta didik kelas XI MIPA yang berjumlah 19 orang. Teknik sampling yang digunakan adalah teknik non probability sampling khususnya teknik smapling jenuh. Penelitian ini menggunakan metode kuantitatif deskriptif. Hasil dari penelitian ini adalah didapatkan hasil bahwa video pembelajaran memiliki pengaruh terhadap kemampuan pemecahan masalah pembelajaran kimia yang melalui google classroom di SMAS Muhammadiyah hal tersebut berdasarkan dengan hasil uji t.

KataKunci: Video Pembelajaran, KemampuanPemecahanMasalah, Google Classroom

• INTRODUCTION

Humans are always faced with a problem. The most serious problem that is currently happening, not only in Indonesia, but also in almost the entire world, is the presence of the corona virus. The virus is thought to have originated in Wuhan, China. The virus causes things that are very deadly for humans who are infected with the virus. The virus has weakened all sectors such as economic, political, social and cultural as well as education. The world has determined that this virus is one of the pandemic viruses and its existence can threaten the human population. Humans who are infected with this virus will

experience respiratory illness and can even die. Therefore, the government implements a social distancing system and orders everyone to stay at home, so children don't go to school and go to school online or from home. (Nirwansyah, 2020).

Based on the Circular Letter of the Minister of Education and Culture of the Republic of Indonesia Number 4 of 2020 concerning the Implementation of Educational Policies in the Emergency Period for the Spread of Covid-19, it explains that online learning is carried out to provide meaningful learning experiences for students. Learning from home is focused on life skills education, including the Covid-19 pandemic (Culture, 2020).

Online learning is the use of the internet network in the learning process. Interaction between teachers and students in online learning can use several free applications or platforms in the form of virtual classes, such as google classroom, edmodo and schoology.

All countries in the world have almost implemented all-encompassing policies for the entire community, such as social distancing and all activities from home. Even people who work are prohibited from entering the office and doing all the work from home or known as work from home. It is the same as school children who carry out online learning activities (Chairulhaq et al., 2021). Just like in the world, Indonesia also experiences the same thing that children take part in learning activities from home, but this sometimes makes learning ineffective because all students and teachers need to adapt to the new policy, namely by doing learning from home.

A letter that has been circulated shows that during the pandemic period student learning activities are carried out online. Learning in the era of covid has given results that it focuses on life skills education. Online learning is the use of the internet in the learning process. The online learning system means using facilities and infrastructure that can reach the internet, namely in the form of zoom, schology and edmodo, the learning can reach all people from kindergarten to college children. In the pandemic period like now, everyone must be able to adapt to the new system, one of which is this education system. Children must definitely be able to participate in learning activities using the internet system (Raharja et al., 2019).

The Private High School (SMAS) of Muhammadiyah Mauemere, Sikka Regency is one of the schools that has used and utilized Google Class as a learning tool. In the process during learning, students receive assignments from the teacher and send the results to the application. In addition, teachers can record student attendance and convey topics through the Google Classroom application. Google classroom at SMAS Muhammadiyah Mauemere is used in all learning including chemistry classes. One branch of science education is chemistry education. High school children have received chemistry lessons. Chemistry lessons are one of the subjects that are quite difficult for high school children, therefore the teaching system that is applied must be in accordance with high school children so that children can understand optimally, especially during the pandemic period like now which is done online (Feronica & Gazali, 2020).

Learning chemistry is learning to count, interpret, measure and describe a chemical reaction using chemical formulas needed in everyday life. In learning chemistry students must have high concentration because of the many formulas that are proven by their low ability to solve chemical problems. The low problem solving ability of students is exacerbated by the absence of a variety of learning facilities owned by students. Chemistry is seen as one of the rather difficult and least interesting sciences for most students to learn. The cause of students getting low grades in chemistry learning is because children have no interest in learning chemistry as a result, children are not interested in learning plus the teacher's methods are boring (Candra & Syafii, 2020).

The ability to solve problems is an important indicator to achieve success in learning chemistry. The ability to solve chemistry problems prioritizes the process carried out by students in solving problems than the results of the final answer. A person is said to have problem solving skills if he can find an answer to a problem in a good and correct way. In the problem solving process, it is expected that students can solve problems through a step by step so that it can be seen the flow of thinking and students' understanding of the concepts used. The concepts built by students must be able to be applied to solve various related problems, because in chemistry learning students are not only required to understand chemical concepts, but students must also be able to apply the concepts they understand to solve problems.

Students' learning is obtained from material that has been created and shared by the chemistry subject teacher, so that it makes students not used to solving problems. If the student learning process uses video learning media, students can learn both audio and visual. Students' problem solving skills will be better than just audio. This is reinforced by the results of interviews with chemistry teachers from SMAS Muhammadiyah Maumere who stated that at SMAS Muhammadiyah Maumere the learning process was carried out online using the google classroom framework and offline or the learning process at school was limited in time.

Based on the description of the learning problems that occurred at SMAS Muhammadiyah Maumere, the researchers were interested in conducting research on the effect of learning videos on the ability to solve chemistry learning problems through Google Classroom at SMAS Muhammadiyah Maumere. The formulation of the problem in this research is whether there is an effect of video learning on the problem-solving ability of learning chemistry through google classroom at SMAS Muhammadiyah Maumere.

• METHOD

This research has been carried out at SMAS Muhammadiyah Maumere, Waioti sub-district, East Alok sub-district, Sikka Regency. The population in this study were all students of class XI MIPA SMAS Muhammadiyah Maumere and the samples taken were non-probability sampling techniques. The method used in this research is descriptive quantitative method. Data collection techniques used by using interview techniques and also tests. The data analysis technique used descriptive statistical analysis techniques consisting of the mean, median, standard deviation, range and the highest and lowest scores (Sugiyono, 2017).

• RESULT AND DISCUSSION

Analysis Results

1. Student Problem Solving Ability Test Results Data

Table 1. Description of Students' Problem-Solving Ability Using Learning Videos

Description Statistics	<i>Pre-test Essay</i>	<i>Post-test Essay</i>
n	19	19
Mean (\bar{x})	62,21	85,05
Median (Md)	62	86
Variance (s^2)	68,40	48,16
Std. Deviation (SD)	8,27	6,94
Range (R)	26	28
Minimum Value	50	66
Score Maximum	76	94

The table above can be concluded that the results of discovery learning using

learning video media through google classroom on the basic material of acid-base titration are higher than the pretest value. The median or mean score of the students on the posttest was also higher than the score of the students on the pretest, as well as the maximum and minimum values of students' problem-solving abilities. The range on the posttest value is higher than the pretest because the distance between the minimum and maximum values is far. The value of variance and standard deviation of the pretest was more varied than the posttest.

2. Chemistry Problem Solving Ability of Students for Each Item

Table 2. Complete Each Item Question Ability Solution Problem

Items Question	Score Completeness Participant Educate			
	Pre-Test	Category	Post-Test	Category
1	81	Complete	96	Complete
2	83	Complete	98	Complete
3	56	Note	77	Complete
4	50	Note	82	Complete
5	40	Note	72	Complete

Based on the table above, it can be seen that the students' pretest and posttest scores on items 1-5 were the lowest on item number 5. And 3 items about children did not pass the pretest. However, after being tested using a learning video, the results of the posttest all of the students' scores increased, which was initially incomplete, then all of them were completed. It can be seen in the table that item numbers 1-5 use complete scores.

3. Normality test

Table 3. Test Normality *pretest* and *posttest* Question Essay

Test Results	Db (k-3)	Average	A	Lcount	Ltable	Decision
<i>Pretest</i>	3	62.21	5 %	0.078	0.195	Normal
<i>Posttest</i>	3	85.05	5 %	0.027	0.195	Normal

Based on table 3, the data obtained from the pretest $L_{count} < L_{table}$ or $0.078 < 0.195$ and the posttest test result $L_{count} < L_{table}$ or $0.027 < 0.195$ so that both data are normally distributed.

4. Data analysis

Table 4. Results TestN-Gain Class *Posttest* XI MIPA

Class	Db(n-1)	tcount	ttable	Conclusion
XI MIPA	18	69.42	1,734	Significance

Based on the results of the hypothesis test above, it was found that 19 students in class XI MIPA were using discovery learning through google classroom. The value of $t_{count} > t_{table}$, it can be concluded that this research is very significant which uses a significance level of 5%.

Discussion

The data used and processed in this study are the results of the posttest of students' chemical problem solving abilities. The problem-solving ability test consists of five descriptive questions covering four aspects of problem-solving ability, problem-solving

planning and the interpretation of the obtained solution. The posttest questions determine the problem solving of first graders using instructional videos. The posttest questions are national exam questions validated by the validator.

Learning media is a learning resource that can assist teachers in enriching students' insights, with various types of learning media by teachers, they can be used as material in providing knowledge to students (Nurrita, 2018).

Learning media can also be interpreted as everything both physical and technical in the learning process that can help teachers to make it easier to convey subject matter to students so as to facilitate the achievement of learning objectives that have been formulated (Adam, 2015).

Learning media is a very important element in learning activities. In the learning process, the media has a contribution in improving the quality and quality of learning. The presence of the media not only helps students understand the material, but is able to provide added value to the process of learning activities. The function of the media is as a message distributor. Teaching media can enhance student learning processes in teaching which in turn can enhance student learning outcomes achieved. Learning media can increase the effectiveness of communication and interaction between teachers and students. The main function of learning media is as a teaching aid that also influences the climate, conditions, and learning environment that are arranged and created by the teacher (Hamruni, 2012).

The learning process in class XI MIPA was carried out in four meetings, of which two were conducted online and twice offline with acid-base titration material using learning videos with the discovery learning method based on the learning steps that had been prepared.

Before applying learning using learning videos in class XI MIPA, students were given a pretest to work on and the results of the pretest of chemical problem-solving abilities were obtained with an average of 62.21. Meanwhile, after applying learning using learning videos in class XI MIPA, students were given a posttest to work on and the posttest results of chemical problem-solving abilities were obtained with an average of 85.05. Judging from the lowest score, the posttest of class XI MIPA, which is 66, is greater than the pretest, which is 50, when the pretest is carried out, the lowest score obtained by students is when the score of chemical problem solving ability is . However, after the posttest, it turned out that the score was even higher. This indicates that the media used has succeeded in improving students' problem-solving abilities in doing chemistry.

Video media in learning includes audio-visual media, namely media that rely on hearing and sight. Learning video media is a set of components or media that displays images and sound at the same time (Sikiman, 2012). According to (Kustandi and Sutjipto, 2013) video is a tool that can provide information, explain processes, explain complex concepts, teach skills, shorten or slow down time and influence attitudes. According to the Big Indonesian Dictionary, video is a live image recording or television program to be broadcast on television (KBBI, 2017).

Google Classroom is an application that allows the creation of classrooms in cyberspace. In addition, Google Classroom can be a means of distributing assignments and even assessing submitted assignments (Hammi, 2017). Google Classroom is a mixed learning platform developed by Google for schools or other educational institutions that aims to simplify the creation, distribution, and implementation of assignments in a paperless way (Imaduddin, 2018). Based on the understanding according to the experts above, the researchers concluded that Google Classroom is an application developed to meet the needs of schools in terms of the learning process

The first meeting was conducted online with the help of google classroom. Through the google classroom, the researcher conveys basic competencies (KD), indicators of

competency achievement (GPA), learning objectives and student attendance that has been prepared by the researcher. After that, the delivery and explanation of learning materials in class XI MIPA is done by sending learning videos that have been prepared and watched by students through google classroom. After watching the learning video, the researcher sent the Student Worksheet (LKPD) and asked the students to complete the LKPD.

The learning process at the first meeting there were still obstacles in the learning process because some students did not have internet quota. This hampers the learning process of students. As for the students who are still confused and ask the researcher what should be written in the LKPD in the problem solving indicators section. Another obstacle faced is in students' understanding of the material, on average students do not understand what the teacher will teach, which ultimately makes students not understand when learning is carried out.

The second meeting of the researchers directly carried out the offline learning process or the classroom learning process, but still paid attention to health protocols. The researcher also replayed the learning video that had been sent to google classroom using a laptop, InFocus projector and speakers while explaining the material to students again. The researcher also re-explained the stages in working on the LKPD in accordance with the indicators of problem-solving abilities.

The use of learning videos in which contains learning materials, examples of chemistry problems and stages of solving chemistry problems that motivate and guide students how to solve a chemical problem in the problem. The application of learning videos in the experimental class is applied according to the learning steps. In each material there is an example of a problem that will be discussed and explained how to solve the problem in stages.

The third meeting of the learning process using online (online) using google classroom. After that, the researcher sent back the learning video that had been prepared and watched by the students. After watching the learning video, the researcher sent the LKPD back and asked the students to complete it. From this third meeting, students began to get used to using it without any interference and students understood how to fill out the LKPD and what to write in the problem solving indicator section.

The fourth meeting of researchers re-do the learning process offline or the learning process in the classroom. This meeting is related to the practice of acid base titration. But before that, learning begins with praying together led by one of the students, followed by the delivery of basic competencies (KD), indicators of competency achievement (GPA), learning objectives and taking attendance of students who have been prepared by researchers. Before the students did the practicum, the researcher showed a practicum learning video using a laptop, InFocus projector and speakers and distributed the LKPD Practicum as a guide in doing the practicum and divided the students into three groups. After the students finished watching the practicum video, the researcher directed the students to the MIPA Education Faculty laboratory to do the practicum there. Due to inadequate school laboratory facilities. During the practicum, the researcher saw the enthusiasm of the students in doing practicum and asked a lot of questions regarding the tools and materials used and the color changes that occurred at the end of the titration. While the students were doing the practice, the researcher explained the questions asked by the students. After the practice is done, students work on the LKPD that has been distributed by the researcher.

The use of learning videos in which contains learning materials, examples of chemistry problems and stages of solving chemistry problems that motivate and guide students how to solve a chemical problem in the problem. The application of learning videos in class XI MIPA is applied according to the learning steps. In each material there

is an example of a problem that will be discussed and explained how to solve the problem in stages based on problem solving indicators, namely understanding the problem, planning problem solving, solving problems, and interpreting the solutions obtained.

After the students watch the learning video, the researcher guides the students to investigate the chemical problems that exist in the worksheets that are given to find problems, how to solve problems, and solve these problems. can solve the problem.

The differences that arise from video learning focus on improving four as an indicator item of a problem solving, namely understanding the problem, designing problem solutions, solving problems, and interpreting the solutions obtained. The weekly chemistry problem solving test instrument questions are similar to the indicators identified and defined. Improved chemical problem solving using video using lebaranataan from the results of the analysis of the results of the post test results of student respondents' scores being better than the pretest.

In the ability to understand the problem, student activities determine what is known from the problem and what is required from the problem. Based on the calculations carried out, the indicator of understanding the problem after the test was higher than the first test. Regarding the value obtained, it can be seen that the ability to understand the problem after the test is better during the pretest. This is because students when given instructions cannot distinguish what is known in the problem and what is done by the question.

When planning problem solving, one of the things that students must learn is to very correctly organize information so that mistakes do not occur. From the value obtained based on the calculation results, it can be seen that the ability to plan problem solving in the posttest is higher than the pretest. This is because in the pretest, many students cannot use the appropriate formula and use known information to compile information, in contrast to the posttest, students can already use the appropriate formula and use known information to compile information.

In the ability to solve problems, the activities carried out by students are prescribing the known values in the formula and calculating the problem solving that has been made correctly and correctly. On the ability to solve problems, the achievement of the indicators of the posttest students was higher than the pretest. This is because in class XI MIPA students are less able to simulate and calculate problems, so there are many errors in determining, as a result students are less careful in solving problems because they do not understand the previous material.

In the ability to interpret the solutions obtained, the activities carried out by students are re-checking the answers to the final results of the calculations that have been carried out. Based on the calculations carried out on the indicators of checking back on the answers, the posttest results were higher than the pretest because in the pretest students did not re-check the answers from the results of the calculations that had been done.

The achievement of the indicator of students' chemistry problem solving ability is the lowest in class XI MIPA, namely the indicator of rechecking the answers, because many students do not re-check the correctness of the answers from the results of the calculations carried out. In addition, the ability to solve problems on indicators of substituting known values in formulas and calculating problem solving in the posttest even though it looks high, but there are still students who have not been able to complete calculations because students do not master the prerequisite material that has been studied in this study.

The achievement of students' chemical problem solving skills in chemistry education is supported by learning that guides students to use these problem solving skills. After testing for normality and homogeneity, it was concluded that the two classes were normally distributed and homogeneous. The results of hypothesis testing and t-test showed

that students of video media management and problem solving had higher posttest scores than pretest scores before using video.

The results of this study are supported by research findings (Mu'minah, IH, & Gaffar, 2020) "Audio Video Learning Media on Students' Mathematical Problem Solving Ability". The results of the study indicate that students' abilities are influenced by one of them is the application of video learning at school and the teacher is very good at using interesting methods so that children like learning mathematics in class, as a result, it can increase student learning outcomes. In addition, as for research from (Kristiana, 2021) entitled "Development of Video Learning Media to Practice Problem-Solving Ability in Acid-Base Solution Material" which shows that video-based learning media is oriented towards problem-solving skills in acid- base solution material has a positive effect on activities. learning.

From the results of this study, it was found that the use of video learning media was effectively used in acid-base titration material. Children really enjoy and are happy when using this method. In addition, to strengthen research from previous studies, it also shows the same thing as this study. It is hoped that with this research, it is hoped that students and teachers will be more enthusiastic in learning chemistry in the classroom, and can create other more interesting methods.

Google Classroom has several advantages, including: a simple display design that is easy to use, optimal time savings by relying on the integration process and automating the use of other Google applications such as spreadsheets and google documents, cloud-based applications, flexible nature so that it can be used anytime and anywhere, very responsive and the use of the application is free of charge (Simanihuruk, 2019).

The results of this study are supported by the research findings of (Syafinatun & Laila Raudhatul Jannah2, 2021) "Audio Video Learning Media on Students' Mathematical Problem Solving Ability". The results of the study indicate that audio video learning media affects students' mathematical problem solving abilities. In addition, as for research from (Agustina, A., and Novita, 2012) entitled "Development of Video Learning Media to Practice Problem-Solving Ability in Acid-Base Solution Material" which shows that video-based learning media oriented to problem- solving skills in acid- base solution material has a positive influence on learning activities.

Through this research, it is known that learning videos are better and more efficient to use in learning activities on acid-base titration material, which is supported by the results of previous studies that provide strong empirical evidence as a basis for teachers to apply it in teaching and learning activities in schools.

• CONCLUSION

Based on the results of the research and discussion that has been described, it shows that the use of educational videos has an impact on solving chemistry learning problems through google classroom at SMAS Muhammadiyah Maumere. Choosing the right learning curve can affect students' problem solving abilities. To study the chemistry of acid base titration data, there is an opportunity to learn by solving problems using video media. Students' problem solving skills are related to chemistry learning. Students with high problem solving skills achieve better academic results than students with low problem solving skills. Teachers are expected to be able to improve students' problem solving skills through various subject relationships included in the curriculum. The results of this study are used as a reference for teachers and prospective teachers in choosing a curriculum-based curriculum, in order to improve students' problems in understanding teaching materials.

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