THE INFLUENCE OF THE USE OF CANVA-BASED VIDEO LEARNING MEDIA ON THE MATHEMATICAL PROBLEM-SOLVING ABILITY OF CLASS XII STUDENTS OF SMA NEGERI 1 AIR JOMAN

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ABSTRACT

This research aims to determine the effect of using Canva-based video learning media on the mathematical problem solving abilities of class XII students at SMA Negeri 1 Air Joman. This type of research is quasi-experimental with a two-group pretest and posttest research design. The population in this study were all students of class XII Science consisting of 3 classes. The research samples used were 2 classes (Class XII IPA-2 and XII IPA-3) with 30 students in each class. In class XII IPA-3 was an experimental class using Canva-based learning video media and in class XII-2 as a control class without using Canva-based learning video media. After the learning was completed, a posttest was obtained with an average result for the experimental class of 80.5 and the control class of 76.4. The t-test results obtained t_count (3.774)> t_table (2.001). H_a is accepted, thus there is a positive and significant influence in the use of Canva-based video learning media on the mathematical problem-solving abilities of class XII students at SMA Negeri 1 Air Joman.

Keywords: Learning Video Media, CANVA, Mathematical Problem Solving Ability.

INTRODUCTION

Mathematics consists of four fields, namely arithmetic, algebra, analysis and geometry. This explains that mathematics covers various fields and not only relates to thinking and reasoning but also to logic, concepts, structure and quantity. Laia (2019) states that mathematics is "the science of logic, of shape, arrangement, quantity, and concepts that are related to one another. Most students say that learning mathematics is a lesson that is difficult to understand and only certain students are able to learn it. Because the objects are abstract, there is some mathematical material that is difficult to give examples of its use in students' daily lives. Therefore, most students do not like studying mathematics. Mathematics is one of the subjects that contributes to the development of students' problem solving abilities.

Batubara & Ariani (2016) state that learning video media are all strategies for conveying information that are used in accordance with learning theory, directing messages, generating reflection, attention, feelings and student readiness so that they can support the

learning process intentionally and with attention. Utilizing videos as a source and teaching tool is one technique for creating a mathematics learning process. One type of media that simultaneously displays sound and images is learning videos. Maulani et al (2022) say that students can watch and study learning videos anytime and anywhere. Likewise, Octavyanti & Wulandari (2021) stated that direct (face-to-face) and distance learning can use video-based resources. Learning videos contain many benefits that can increase students' learning motivation.

The advantages of learning video media according to Jamaliyah & Wulandari (2022) include:

1. Communication skills,
2. Problem solving ability,
3. Can explain something in depth and complex,
4. Can be repeated,
5. Can learn independently.

The main attraction of learning video media that can display visuals and sound is that students can process information or messages more quickly when using several senses. According to Batubara & Ariani (2016), students are able to receive the information taught to them when learning occurs using video media which is very good. Even though it is not in physical form, video media can provide real experiences.

The following are several reasons why educational videos are suitable for use as learning media:

(1) make maximum use of class time,
(2) provide additional opportunities for students to learn actively, and
(3) using videos to help students understand the topic.

Everyone has a different learning style, so using videos meets all these requirements. Apart from that, Agustini & Ngarti (2020) stated that learning videos help teachers avoid using too many lecture models during the teaching and learning process. It is hoped that learning videos can increase students' interest in learning, motivate themselves, and by using learning videos students can get an overview of the concepts being studied. Wisada et al (2019) stated that students are indirectly invited to understand real life continuously and practice mathematical problem solving skills in order to lead to a better direction and make them more independent in the learning process. Sirait (2016) states that students who have high motivation to learn are better at understanding and applying mathematics and can help them develop problem-solving, critical, creative, thinking and logical abilities.

According to Handayani & Rahayu (2020), interactive learning media has enormous potential to encourage students to react positively to the content presented and turn it into a learning tool that can improve academic achievement. Canva for Education is a digital-based learning media application that is popularly used by educators in the current learning process. In the Canva for Education application, there are many advantages that educators can take advantage of. In line with the opinion of Maharani et al. (2022), Canva for education has several benefits for the world of education, such as: 1) utilizing free editing tools, copyrighted images, writing, films, animations and other media to combine learning with student activities; 2) provide unique educational templates for a variety of subjects, grade levels, and resources; 3) allow materials, assessments, and feedback to be provided to students whenever necessary; 4) offer various interesting feedback in the form of text stickers or illustrations; and 5) can be easily integrated with a variety of online learning platforms, including Microsoft Teams, Moodle, Google Classroom, Schoology, and others. Apart from that, Canva for Education can be operated using smartphones and computers online using the internet network.

The use of interactive media based on the Canva application is based on the perception that learning activities will run well and smoothly if the learning media used can attract students' attention and interest so that students can operate it themselves. Meanwhile, Fikri (2018: 125) said that children prefer to learn using computers or Android devices as a learning method. In this way, students can understand the material well and can solve the mathematical questions or problems given. By implementing learning media using the Canva application, it is hoped that it can have a positive influence, namely that it can be a fun variation of learning media and the media design time is short enough so that teachers become proficient and professional. Meanwhile, for students, it is hoped that students can participate and actively interact in learning activities so that students' learning outcomes and mathematical problem solving abilities also increase. Based on several similar studies, it can be said that the use of learning media based on the Canva application is suitable for use in learning and can improve students' mathematical problem solving abilities.

Problem solving ability is one of the cognitive abilities that is the target of educational goals in schools. Hijjah & Sopiany (2016:269) say that having proficiency in mathematical problem solving abilities allows students to gain experience using the knowledge and skills they already have to apply to solving non-routine problems so that they can help them succeed in everyday life. According to Zetriuslita (2015:77), mathematical problem solving has two meanings, namely as a learning approach and as a process of finding a solution to a problem. Problem solving as an approach is used by educators in an effort to explore students' knowledge related to existing problems, in the form of mathematical concepts and principles starting with presenting the problem contextually. Thus, the acquisition of knowledge and skills in problem solving occurs from experiences as initial knowledge that can be synthesized.

Attachment to Minister of National Education Regulation No. 22 of 2006 states that problem solving is the focus of mathematics learning which includes closed problems with a single solution, open problems with a non-single solution, and problems with various ways of solving them. According to Polya in Anisah & Mawaddah (2015:167) in solving problems there are four steps that must be taken, namely:

1. Understand the problem

The aspect of understanding the problem involves deepening the problem situation, assessing the facts, determining the relationship between the facts and formulating a problem question. Every written problem, even the easiest ones, must be read several times and the information contained in the problem studied carefully.

2. Make a problem solving plan

The solution plan is built by considering the structure of the problem and the questions that must be answered. In the problem solving learning process, students are conditioned to have experience applying various kinds of problem solving strategies.

3. Implement a problem solving plan

To find the right solution, the plans that have been made must be implemented carefully. Diagrams, tables, or sequences are constructed carefully so that the problem solver will not be confused. If inconsistencies arise when implementing the plan, the process must be reviewed to find the source of the problem.

4. Look (check) again

During the check, solutions to the problem must be considered.

Based on the steps to solve the problem above, indicators of mathematical problem solving ability can be prepared according to Nasution (2016:54) as follows:

1. Understand the problem
2. Plan the solution
3. Implement the plan

4. Check the results obtained again

Based on several expert opinions, it can be defined that problem solving is an attempt to find a way out of a difficulty and achieve a goal that cannot be achieved immediately.

The demand for problem-solving abilities is always emphasized in every existing curriculum as a basic competency that must be developed and integrated into a number of appropriate materials. The importance of students' problem solving abilities in mathematics means that the ability to solve problems is a general goal of teaching mathematics. In reality, the mathematical problem solving abilities of class XII students at SMA Negeri 1 Air Joman are still low. This is in accordance with the results of observations made by researchers through direct question and answer activities with students regarding their responses to problems and especially in solving mathematical problem solving questions. This is because students are not used to solving problem solving questions. For example, how students understand a problem, how to solve a problem, what the problem solving procedure is and whether they are careful about the answers they get. It turns out that students are unable to solve questions that they consider difficult and they can only solve questions that match the examples given by the teacher. Apart from that, there is a lack of student desire in learning, students have wrong perceptions of mathematics learning, students do not understand the material being taught, students are unable to understand the problems posed, students ignore the use of learning media. Students are not used to solving mathematical problems in the form of problem solving and only depend on the procedures taught by the teacher.

The problems above will cause the expected learning objectives not to be achieved and in general the abilities that students are expected to master in learning will not be achieved. Researchers provide a solution using learning video media. The use of learning media in the digital era is required to improve teaching standards because this can encourage more efficient learning. Winarni et al (2021) said that the use of learning video media had a significant impact on students in understanding the concepts of the material being taught. Students will understand more easily if the learning is interesting. So that students' mathematical problem solving abilities become better. Likewise, Fauziyyah (2019) states that learning video media is an audio-visual based learning media that contains explanations of material presented with interesting pictures or animations along with sound which is used to explain the material clearly and concisely. Because learning video media can also be seen by students many times if they forget the learning material. With this learning video media, teachers can find out whether students' problem solving abilities are better or not. This is in accordance with research by Harefa et al (2021) which states that audio video learning media influences students' mathematical problem solving abilities.

METHOD

This research was conducted in class XII of SMA Negeri 1 Air Joman located in Air Joman District, Asahan Regency. This research was carried out for 1 month, namely early December to early January. The type of research used is quasi-experimental research with a two group pretest and posttest research design. Research that aims to determine whether or not there is an influence of something imposed on students as research subjects. The influence in question is the student's numeracy literacy ability with a predetermined learning model which can be seen from the results of the student's answers on the student's numeracy literacy ability test.

According to the relationship between one variable and another, research variables can be divided into independent variables or independent variables and dependent variables or dependent variables. The independent variable is the variable that influences or is the

cause of the change or emergence of the dependent (dependent) variable. The research design uses a two group pretest and posttest design according to Sugiyono (2012:74) as follows:

Table 1. *Two Group Pretest-Posttest Design*

Treatment Group	*Pretest*	Treatment	*Posttest*
Experiment	O_1	X_1	O_2
Control	O_1	X_2	O_2

Information:

O_1 : Pretest
O_2 : Posttest
X_1 : Using Canva-Based Learning Video Media
X_2 : Not Using Learning Video Media

The population in this study was all students in class XII IPA divided into 3 classes consisting of class XII IPA-1 = 30 students, XII IPA-2 = 30 students, and The class division arrangements are random and not based on ranking so there is no superior class.

Therefore, the samples taken in this research were classes XII IPA-2 and XII IPA-3 of SMA Negeri 1 Air Joman, each consisting of 30 students. This research uses an instrument in the form of descriptive questions consisting of 5 questions that have been tested in schools that are equivalent to the school to be studied using statistical validation. For Learning Implementation Plans, grids, test trials of students' mathematical problem solving abilities and answer keys.

In data analysis to find the right conclusions from this research, we must first analyze the data that has been obtained to get the hypothesis results. This normality test aims to find out whether the data to be studied is normally distributed or not. If the data studied is normally distributed, then the data is then analyzed using parametric statistical techniques. However, if the data studied is not normally distributed, then parametric statistics cannot be used, henceforth non-parametric statistics are used Sugiyono (2012: 248).

If both have a normal distribution, then proceed with the homogeneity test of the two variances. The next step is to test the hypothesis. If the data on students' numeracy literacy skills is normally distributed data and has a homogeneous variance, then a test of equality of two means (t-test) is used. With the following hypothesis:

H0 :$\mu_1 = \mu_2$: There is an influence of Canva-based learning video media on the mathematical problem solving abilities of class XII students at SMA Negeri 1 Air Joman

Ha: $\mu_1 \neq \mu_2$: There is no influence of Canva-based learning video media on the mathematical problem solving abilities of class XII students at SMA Negeri 1 Air Joman

According to Sudjana (2005:239) hypothesis testing is carried out using the similarity test of two means (t-test) as follows:

$$t' = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\left(\frac{s_1^2}{n_1}\right) + \left(\frac{s_2^2}{n_2}\right)}}$$

Information:
t' = calculation price
$\bar{x}_1$ = average score of the experimental class
$\bar{x}_2$ = control class average score
n_1 = number of experimental class samples

n_2 = number of control class samples
s_1^2 = Experimental class variance
s_1^2 = Control class variance

Criteria:
If t_{hitung} = t_{tabel} then H_0 is accepted
If t_{hitung} > t_{tabel} then H_0 is rejected

At a significant level 5% with dk = $(n_1 + n_2 - 2)$ = 30 + 30 – 2 = 60– 2 = 58 and obtained t_{tabel} = 2,001. Based on calculation results with a level of confidence α = 0,05. So, t_{hitung} = 3,774 and t_{tabel} = 2,001. So t_{hitung}> t_{tabel} as H_0 is rejected and H_a is accepted.

RESULT

The normality test of pretest data in two classes, namely the experimental class and the control class, was carried out using SPSS Statistics 2.0 as follows:

Table 2. *Descriptive*

Group	Mean	Variance	Std. Deviation	Minimum	Maximum
Eksperiment	66,13	66,46	8,153	52	82
Control	61,31	139,89	11,827	44	78

Based on the SPSS Statistics 2.0 calculation results in the table, student learning outcomes in the experimental class were obtained with an average (x⁻)=66, variance = 66.46 and Standard Deviation (Standard Deviation) = 8.153. Meanwhile, student learning outcomes in the control class average (x⁻) = 61.31, variance = 139.89 and Standard Deviation (Standard Deviation) = 11.827.

The normality test was carried out using the Liliefors test, in the experimental and control classes. From the normality table of students' numeracy literacy test data in the experimental class, Lo = 0.137 with n = 30 and a real level of α = 0.05. So the critical value using the Liliefors test is obtained Ltable = 0.161.

The conclusion is that L0 < L table is 0.137 < 0.161, so it is proven that the population is normally distributed. Normality of data from the numeracy literacy ability test of students in the control class Lo = 0.159 with n = 30 and significance level α = 0.05. So the critical value using the Liliefors test is obtained Ltable = 0.161. The conclusion is that Lo< Ltable is 0.159 < 0.161, so it is proven that the population is normally distributed.

Table 3. Experimental Group Normality and Control Group Test Data

Group	L_0	L_{tabel}	Conclusion
Eksperiment	0.137	0,161	Normal distribution
Control	0.159	0,161	Normal distribution

To calculate the homogeneity of variance in the experimental and control class pretest data, SPSS Statistics 2.0 was used, namely

Table 4. Pretest Homogeneity Test Data

α	N	F_{hitung}	F_{tabel}	Conclusion
		0,475136	0,5374	Homogen
0.05	30			

Based on the table above, it is obtained that $Fhitung$ = 0.475136 and based on the critical value table with n = 30, significant 5%, $v1 = n1 - 1$ (dk numerator) and $v2$

$= n2 - 1$ (dk denominator) is 0.5374. Because $Fhitung < Ftabel$ then the data has the same or homogeneous variance.

The posttest data normality test in two classes, namely the experimental class and the control class, was carried out using SPSS Statistics 2.0 as follows:

Table 5. *Descriptive*

Group	*Mean*	*Variance*	*Std. Deviation*	*Minimum*	*Maximum*
Eksperiment	80,81	64,257	8,016	68	98
Control	69,385	121,489	11,022	50	90

Based on the SPSS Statistics 2.0 calculation results in the table, the numeracy literacy abilities of students in the experimental class were obtained with an average $(\overline{x})$=80.81, variance = 64.257 and Standard Deviation (Standard Deviation) = 8.016. Meanwhile, the numeracy literacy abilities of students in the control class had an average $(\overline{x})$ = 69.385, variance = 121.489, and Standard Deviation (Standard Deviation) = 11.022.

Data normality testing using SPSS Statistics 2.0 calculations shows that for the experimental class (listed in attachment 24) obtained Lcount = 0.094 and Ltable = 0.161 with N = 30, because Lcount < Ltable (0.094 < 0.161) it can be concluded that the data in the experimental group normally distributed. Meanwhile, for the control class, Lcount = 0.155 and Ltable = 0.161 with N = 30, because Lcount < Ltable (0.155 < 0.161), it can be concluded that the data in the control group is normally distributed.

Table 6. Table of Normality Test Data for Experimental Group and Control Group

Group	L_0	L_{tabel}	Conclusion
Eksperiment	0,094	0,161	Normal distribution
Control	0,155	0,161	Normal distribution

To calculate the homogeneity of variance in the experimental and control class posttest data, SPSS Statistics 2.0 is used, namely:

Table 7. Posttest Homogeneity Test Data

α	N	F_{hitung}	F_{tabel}	Conclusion
0.05	30	0,5389	0,5474	Homogen

Based on the table above, it is obtained that $Fhitung$ = 0.5389 and based on the table of critical values with $n = 30$, significant 5%, $v1 = n1 - 1$ (dk numerator) and $v2 = n2 - 1$ (dk denominator) is 0.5474. Because $Fhitung < Ftabel$ then the data has the same or homogeneous variance.

To find out whether the data hypothesis can be accepted or rejected, a two-party test is used with the formulation of the hypothesis being:

H0 :$\mu_1 = \mu_2$: There is an influence of Canva-based learning video media on the mathematical problem solving abilities of class XII students at SMA Negeri 1 Air Joman

Ha: $\mu_1 \neq \mu_2$: There is no influence of Canva-based learning video media on the mathematical problem solving abilities of class XII students at SMA Negeri 1 Air Joman

The results of hypothesis testing can be seen in the table as follows.

Table 8. Two Party Posttest t Test Results (Final Hypothesis)

No	Data	Average	t_{hitung}	t_{tabel}	Conclusion
1.	*Posttest* Eksperimen class	80,5	3,774	2,001	there is influence

2.	*Posttest* Control class	76,4

In the summary table above, the posttest scores are obtained t_{hitung} = 3,774 > t_{tabel} = 2,001 so H_0 is rejected H_a is accepted.In this case, it was concluded that there was an influence of Canva-based learning video media on the mathematical problem solving abilities of class XII students at SMA Negeri 1 Air Joman.

This is in line with research conducted by Harefa, et al (2021) entitled "Audio Video Learning Media on Students' Mathematical Problem Solving Ability". Based on the results of research data processing and discussion of the research results that have been described, it can be concluded that the use of audio-visual learning media can influence students' mathematical problem-solving abilities. This is because students understand the material being taught better by visually seeing the statistical material objects being studied. Apart from that, abstract objects are displayed more like more concrete objects. Students can repeat studying material they don't understand by playing the learning video again.

DISCUSSION

At SMA Negeri 1 Air Joman there are 3 classes for class XII Science. The research sample class consisted of 60 students, namely class XII IPA - 1 with 30 students and XII IPA - 2 with 30 students. There are two tests used in the research, a test before learning (Pretest) and a test after learning (Posttest). The test is used to determine students' abilities in the form of a description test with 5 questions. This test has previously been tested for validity, reliability, distinguishing power and level of difficulty. In the sample class, students in class XII IPA - 2 as an experimental class were taught using Canva-based video learning media and class.

The researcher tested the analysis requirements based on the data obtained by the two classes. Based on the results of SPSS Statistics 2.0 calculations in the table, the average student learning outcomes in the experimental class are $(\bar{x}) = 66$, varians = 66,46 and Standart Deviasi = 8,153. Meanwhile, student learning outcomes in the control class were average $(\bar{x}) = 61,31$, varians = 139,89 and Standart Deviasi = 11,827. The normality test was carried out using the Liliefors test, in the experimental and control classes. From the normality table, the data on the numeracy literacy ability test of students in the experimental class was obtained L_o = 0,137 with n = 30 dan α = 0,05. Then the critical value via the Liliefors test is obtained L_{tabel} = 0,161.

Conclusion L_0< L_{tabel} is 0,137 < 0,161 then it is proven that the population is normally distributed. Normality of data from the numeracy literacy ability test of students in the control class L_o = 0,159 dengan n = 30 dan taraf nyata α = 0,05. Then the critical value via the Liliefors test is obtained L_{tabel} = 0,161. conclusion L_o< L_{tabel} is 0.159 < 0,161 then it is proven that the population is normally distributed. Result F_{hitung} = 0,475136 with $n = 30$, $α =$ 5%, $v_1 = n_1 - 1$ (dk pembilang) and $v_2 = n_2 - 1$ (dk penyebut) are 0,5374. Because of F_{hitung} < F_{tabel} then the data has the same or homogeneous variance and the results of t_{hitung} adalah 6,442. Conclusion t_{hitung} = 3,774 > t_{tabel} = 2,001 so H_0 is rejected H_a is accepted. In this case, it was concluded that there was an influence of Canva-based learning video media on the mathematical problem solving abilities of class XII students at SMA Negeri 1 Air Joman.

CONCLUSION AND SUGGESTIONS

Based on posttest data analysis, the experimental class and control class had a normal distribution and both variances were homogeneous. Next, hypothesis testing is carried out $t_{hitung} = 3,774 > t_{tabel} = 2,001$ so H_0 is rejected H_a is accepted. In this case, it was concluded that there was an influence of Canva-based learning video media on the mathematical problem solving abilities of class XII students at SMA Negeri 1 Air Joman.

Mathematics teachers are expected to apply Canva-based learning video media to students' mathematical problem solving abilities in the learning process because with this method students can be more active in the learning process and can relate the learning material to their daily lives. Students are expected not to think of mathematics as a boring field of study but a field of study that is fun and broadens their thinking horizons.

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