

Application of Virtual Sevima Edlink Class with Inductive Approach to Solving Math Problems Class X MA Mamba'ul Ma'arif

Khusnul Khotimah¹, Nur Faizah²

^{1,2} Mathematics Education, Universitas KH. A. Wahab Hasbullah

*Email: khusnulhotimah@unwaha.ac.id

ABSTRACT

This research is a quasi-experimental quantitative study that focuses on solving mathematical problems with inductive approaches to experimental classes that apply virtual classes to edlinks while control classes with conventional classes. The population in this study is class X-A and X-B MAS Mamba'ul Ma'arif School Year 2021-2022. The population will be sampled in the study. The purpose of this study is to find out if the application of sevima edlink virtual class is better than conventional class with inductive approach in solving math problems of class X MAS Mamba'ul Ma'arif. Based on the results of statistical calculations using SPSS 21 application, on the results of pretest data and posttest hypothesis test using Independent Sample t-test obtained value Sig = 0,007 < 0.05 which means that solving math problems through experimental classes with the sevima edlink app is better than a control class with conventional learning. Advice for other researchers sevima edlink application is the right application used to build and improve the ability to solve math problems and can also be used for all subjects at the high school level (SMA) equivalent.

Keywords: *Sevima Edlink; Inductive Approach; Problem Solving.*

INTRODUCTION

The advancement of science and technology (IPTEK) is now demanding that the younger generation must have sufficient basic knowledge on it (K. Khotimah, 2017). National Development in the field of education is necessary to educate the younger generation and develop their talents as a whole. Communication and information technology can be said as a place or a place to provide information for a long distance. Technology is always innovating every year to year even in the era of the technology-based industrial revolution 4.0, with which teaching and learning activities now no longer have to be in the classroom. Industry 4.0 was first created in Germany in 2011 focusing on the digital industry. Industry 4.0 combines technology and digital at that time and now the industry is growing very rapidly (Wibowo, 2020).

With the help of technology can increase the interest and motivation of learning and has great potential to reach a diverse student population where and whenever they need help (Carolin & Luta, 2018). Researchers take the initiative to invite high school students to join or take virtual classes that have been created by utilizing increasingly advanced technology. The virtual class in question is *sevima edlink*, an android-based application devoted to the world of education that aims to provide a learning space that bridges educators and students in learning activities that can be done anytime and anywhere with more flexible learning time. Virtual classes are substantially, should be no different from conventional classes. An educator must create an effective learning environment according to what was previously planned.

Virtual classroom learning media sevima edlink can be obtained linked <https://app.edlink.id> or obtained diplaystore for android gadgets for free. The front view of the virtual classroom learning media is as shown below:



Figure 1 Sevima Edlink Logo



Figure 2 Sevima Edlink Registration Page

Choosing the right model or approach of learning by educators will make it easier for students to do the learning process with the strategy of implementing edlink virtual classes (Marlina, 2020). One of the approaches used in the application of virtual classes is with an inductive approach in which the process emphasizes on observation first, then draws conclusions based on observations made (Purwanti, 2016).

The context of learning, inductive approach means teaching that begins by presenting a number of special circumstances and can then be summed up into a concept, principle, or rule (Suwangsih, n.d.). Learning with an inductive approach begins with observing specific things and interpreting them, analyzing cases, or giving contextual problems, learners are guided to understand concepts, rules, and procedures based on the observations of the learners themselves (Larasati, 2020). In facts mathematics is a science held on reason that relates to abstract objects and thoughts (K. dan M. farid N. Khotimah, 2018).

Mathematics is the basis of all science and technology in the world. Therefore, mathematics needs to be mastered by all Indonesian citizens, both its application and mindset (K. dan M. farid N. Khotimah, 2018). Mathematics has something to do with solving a problem. The essence of mathematics is a structured and systematic science, as a human activity through an active, dynamic and generative process, as well as a science that develops critical, objective, and open thinking attitudes (Aisyah, 2016). Two important characteristics of mathematics are (1) having abstract event objects and (2) patterned deductive and consistent thinking (Verdianingsih & Firmansyah, 2019). Teaching learners to solve problems allows learners to be more critical and creative in drawing conclusions systematically (Sutarto Hadi, 2014). Educators only encourage students to think and discover their own problem concepts (Darwis & Hardiansyah, 2020).

Achievement of mathematics learning is able to require by (1) formulating problems with specific variables through mathematical approaches, (2) reconstructing, analyzing mathematical models of a problem and drawing contextual conclusions, (3) analyzing various mathematical model alternatives that have been available and presenting independent analysis conclusions for decision making (Putu Pasek Suryawan, 2020). Improving the quality of national education, especially in the field of mathematics is a strategic thing in improving the quality of human resources, it is because mathematics is indispensable both for daily life and in the face of advances in science and technology (Qomariyah et al., 2020).

METHOD

This study was conducted at MAS Mamba'ul Ma'arif with a population of all students of class X of the 2020-2021 School Year to be sampled with a total of 40 students consisting of two classes, namely class X-A as an experimental class and X-B as a control class, so each class there are 20 students with the same ability. This research uses quantitative research with quasi-experimental method, so the research is needed a research design before hypothesizing. The design of this study is as follows.

Table 1. Research Design

Student Group	Pre-Test	Treatment	Post-Test
Experiment	O ₁	X	O ₂
Control	O ₃	-	O ₄

This method of research uses quasi-experimentation, because it has a control class but cannot function fully to control external variables that affect the execution of field experiments. Quasi-experimental research using inferential analysis consisting of normality test, homogeneity test and t hypothesis test.

RESULT AND DISCUSSION

Regarding the results of research that has been done include the results of pretest and posttest tests in the experimental class and the results of pretest and posttest tests in the control class. The results are through normality test, homogeneity test and T test as a condition of statistical test that will be described in the sub-results of the study. For more details on the results of the study, it will be explained below.

Result

The subjects in this study were students of class X-A and X-B MAS Mamba'ul Ma'arif Denanyar. Each class consists of 20 students so that the total number of all students in this study is 40 students.

In this study, data analysis solved the math problems of experimental classes and control classes through pretest and posttest tests analyzed using IBM SPSS 21 and significant levels (level of significant or α) was 0.05 or 5%. Before the data solves the math problems of the two classes are analyzed the average similarity (t hypothesis test), then the researchers conduct normality test and variance homogeneity test as a prerequisite. The description of normality test, variance homogeneity test and average similarity test (t hypothesis test) are as follows.

- Normality Test

In this study, the normality test used the IBM statistic SPSS 21 with the Kolmogorov Smirnov test calculation. The number of data samples was 40 students who were divided into two class groups. On the results of the Kolmogorov-Smirnov test, the data on the ability to solve mathematical problems is said to be normally distributed if the Sig value in the Test of Normality table of the Kolmogorov-Smirnov column > significant level ($\alpha = 0.05$ or 5%), then H_0 is accepted so that the data on the ability to solve problems with using pretest and posttest test questions which through the two classes have been normally distributed. In this study, the results of the normality test can be shown in Table 2 as follows.

Table 2. Output Results of the Kolmogorov-Smirnov Output Normality Test

One-Sample Kolmogorov-Smirnov Test					
		Pretest_ kontrol	Posttest_ kontrol	Pretest_ eksperimen	Posttest_ eksperimen
N		20	20	20	20
Normal Parameters ^a	Mean	79.5500	58.4500	93.9000	80.5000
	Std. Deviation	9.98670	23.24124	15.11326	25.23052
Most Extreme Differences	Absolute	.189	.261	.405	.330
	Positive	.128	.155	.343	.220
	Negative	-.189	-.261	-.405	-.330
Kolmogorov-Smirnov Z		.846	1.167	1.812	1.477
Asymp. Sig. (2-tailed)		.471	.131	.003	.026
a. Test distribution is Normal.					

- Homogeneity Test

In the homogeneity test of variance or the F test using IBM statistical SPSS 21 with independent sample t-test calculation. The sample can be said to be homogeneous if the Sig value in the Lavene's Test for Equality of Variance table > significant level ($\alpha = 0.05$ or 5%). And for the output results of the homogeneity test of variance that have been carried out in the experimental class and control class, it is shown in Table 3 as follows.

Table 3. Output Results of Variance Homogeneity Test

Test of Homogeneity of Variances			
Skor			
Levene Statistic	df1	df2	Sig.
.291	1	38	.593

Based on the output results, it is known that the Sig value on the ability to solve mathematical problems in the two classes is $0.291 > 0.05$ so that H_0 is accepted. So it has been concluded that there is no difference in class variance using the *sevima edlink* virtual class and conventional or face-to-face classes using the same approach. Therefore, the data proves that the research sample is declared to have a homogeneous or the same variance.

- Test the T Hypothesis

The T hypothesis test or the average similarity is used with the aim of knowing whether the research sample uses the Analyze-Compare Means-Independent T-Test formula. As for the data analysis of pretest and posttest questions to solve mathematical problems. Hypothesis testing was carried out with IBM Statistic SPSS 21 by calculating the Independent Sample t-test. For the output results, it can be said that H_0 is accepted if the Sig value in the t-test table Equality of Means column Sig (2-tailed) > significant level ($\alpha = 0.05$ or 5%). The results of hypothesis testing are shown in Table 4 as follows.

Table 4. Results of the T . Hypothesis Test Output

Independent Samples Test						
Levene's Test for Equality of Variances				t-test for Equality of Means		
		F	Sig.	t	Df	Sig. (2-tailed)
Skor	Equal variances assumed	.291	.593	-2.875	38	.007
	Equal variances not assumed			-2.875	37.747	.007

Based on Table 4, it is known that the value of Sig (2-tailed) = $0.007 < 0.05$ so that H_0 is rejected or H_1 is accepted. It can be concluded that H_0 is rejected so that from this analysis it is found that the ability to solve mathematical problems of students using a virtual class with *sevima edlink* is better than a normal class or face-to-face with an inductive approach to class X MAS Mamba'ul Ma'arif.

Discussion

The mathematical ability that must be developed and needs to be mastered by students is the ability to solve math problems by applying the virtual class of *sevima edlink* because it is one of the objectives of mathematics learning in this pandemic. In shaping and developing a mindset to solve math problems for learners need to be done with an inductive approach through the application *sevima edlink* as a medium of learning learners.

In Polya's opinion "the problem solving solution contains four steps of the resolution phase, namely understanding the problem, planning the solution, solving the problem according to the plan, and rechecking all the steps that have been done (P. Mathematics et al., 2014).

At this time, education in Indonesia is undergoing changes in the learning system for students that is felt by all levels of education without exception so that the learning system and learning media used by educators today are based on virtual classes. Therefore, these students can solve mathematical problems with their respective abilities which have low, medium, and high grades. So that with this research it can be said that the ability to solve math problems in class X has improved better than before and students do not feel bored when the learning process takes place.

This is also supported by research results from that learning using *sevima edlink* can be applied as virtual classroom-based learning. As for the control class, students only carry out the conventional or

face-to-face learning process with the same approach in solving mathematical problems. This is supported by the results of research and field notes in the money control class showing that students depend more on teacher explanations, are less active in asking questions about subject matter and minimal study time estimates. In addition, the use of material books as a means of normal or face-to-face learning is also less helpful for students in solving mathematical problems. In the material book there is only a summary of the material, formulas and there is only one example of a mathematical problem and discussion of the problem.

This can be seen from the results of hypothesis testing using the Independent Samples T-Test which shows a significant value of 0.007. This value indicates that the value of $P_{value} < \alpha 0.007 > 0.05$, it can be concluded that H_0 is rejected, meaning that from this analysis it is found that the ability to solve mathematical problems of students using virtual classes with *sevima edlink* is better than normal classes or face-to-face approaches. inductive class X MAS Mamba'ul Ma'arif.

CONCLUSION

The application of the *sevima edlink* virtual class in the world of education is an alternative to the learning process that can condition students to learn independently, so that students are able to think creatively in solving math problems for class X MAS Mamba'ul Ma'arif with an inductive approach.

Based on the results of the calculation of the hypothesis test using the Independent Samples T-Test test which shows a significant value of 0.007 using IBM Statistic SPSS 21. This value indicates that the $P_{value} < \alpha 0.007 > 0.05$, it can be concluded that H_0 is rejected, meaning that from the analysis It was found that the students' ability to solve mathematical problems using a virtual class with *sevima edlink* was better than the normal class or face-to-face with the inductive approach of class X MAS Mamba'ul Ma'arif.

Based on the results of research that has been carried out related to the application of the *sevima edlink* virtual class, the advantages and disadvantages of learning at MAS Mamba'ul Ma'arif. Hopefully, the results of this research can be used as a reflection for educators to improve and improve the quality of the implementation of *sevima edlink's* virtual classroom in learning Mathematics. In addition, this research is still not perfect. So, in the future, it is hoped that the next researcher can do better research.

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