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The Application Class Virtual Sevima Edlink with a Deductive Approach To Improve the Problem Solving Ability of Mathematics

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ABSTRACT
This study aims to determine whether there is influence between the implementation of a virtual classroom Sevima Edlink with a deductive approach in class XI MA Unggulan K.H. Abd. Wahab Hasbullah, to describe the ability of mathematical problem solving experimental class and the control class. This type of research is quasi-experimental research (quasi-experimental) with the use of design non-equivalent control group design. On this design the experimental group and the control group was not selected at random. The sampling technique used is opportunity sampling. The population in this research is all class XI MA Unggulan K.H. Abd. Wahab Hasbullah, the sample in this research is a class of MIPA 2 and IIA 2. The instruments used in quantitative research in the form of pretest and posttest, and a questionnaire. Based on the results of the analysis of the test Paired Sample t-test obtained the value of Sig_{count} *0.00 < 0.05 and the calculation of* $t_{count} > t_{table}$ *(13.942 > 2.093) with df = 19, which means that Ha is accepted and Ho is rejected. Thus it can be concluded that applying the virtual classroom Sevima Edlink with a deductive approach affect the problem solving ability of mathematics class XI in MA Unggulan KH. Abd. Wahab Hasbullah.*

Keywords: *Deductive; Sevima Edlink; Problem-Solving Ability.*

INTRODUCTION
Math is a subject that is studied and the students starts from primary schools, secondary schools and universities, according to the curriculum and learning outcomes (Marlina, 2020). Learning math is a process where teachers teach mathematics to students of his, in which the teacher acts as a facilitator in creating a condition to the ability of learners of mathematics resulting in an interaction between teachers and learners to solve problems, recognize patterns of relationships and generalization of the experience as well as the development creativity (Y. C. Pratiwi, 2016). One of the general purpose of learning mathematics is formulated in Permendiknas No 22 of 2006 about Standard Content, is that the students "have the ability to understand mathematical concepts, explain linkages between concepts, to apply the concept or algorithm for flexible, accurate, efficient, and precise in problem solving, and problem solving which includes the ability to understand the problem, devise a mathematical model, solve the model and to interpret the solutions obtained" (Depdiknas, 2008).

A lot of the criticism directed at the way teachers teach too stressed on the mastery of a number of information/mere concept. The reality on the ground students only memorize the concepts and less able to use the concept if you encounter any problems in real life that is associated with the concept of owned (Khotimah, 2017). According to (Polya, 1978) there are four steps that can be done to resolve the problem, namely (1) understanding the problem, (2) planning problem solving, (3) carry out planning, problem solving, and (4) look back on the completeness of problem solving. Meanwhile, according to Bell 1978 in (Chairani, 2016) solving math problems will help students to improve the ability to analyze and use it in different situations. Problem solving also helps students in learning about the facts, skills, concepts, and principles through an illustration of the application of the object-that object. According to (Ashar & Nur, 2018) to gain the ability in problem solving, someone must have a lot of experience in solving various problems. Various research results show that children who are given plenty of exercise

problem solving have a higher value than in children who practice a little more. Problem solving requires the ability to understand the problem, plan the steps of problem solving, and resolve the matter.

Mathematics problem solving ability of students is still low based on the results of interviews conducted by researchers with teachers mathematics class XI in MA Unggulan KH. Abd. Wahab Hasbullah Jombang who explained that mathematics problem solving ability of students of class XI in MA Unggulan KH. Abd. Wahab Hasbullah Jombang still in the low category because of the lack of interest of the students in a math lesson when learning online. Learners are still difficulties in resolving questions related to the ability of mathematical problem solving, students still can't meet the indicators of achievement that is contained on the ability of mathematical problem solving. In this case, also reinforced with the results of the pretest that has been given by the researchers before the treatment is given in the learning.

In addition to improving mathematics problem solving ability of learners, selection of learning approach that right can also be done by teachers to further enhance the skills of students in the master problem solving skills. This skill becomes one of the important skills to face the era of information like this now where being the capital that is needed to be able to compete in society. Therefore, learners are required to be able to reason effectively, so it can make the choices and take the right decisions and innovative in solving problems. One approach to learning that is appropriate to use is a deductive approach which has the characteristics away from the public heading to the special. According to Atta et al in (Suprapto et al., 2018) a deductive Approach is a learning centered on the teacher, this means that the teachers gave a new concept to students, explain it, and then had students practice using the concept.

Deductive reasoning can be classified as low level or high level. Some of the activities that belong on the deductive reasoning which is (a) Carry out the calculation based on a rule or formula (b) Draw a logical conclusion based on the rules of inference, check the validity of an argument, proving, and draw up a valid argument (c) develop a proof direct proof indirect and proof by mathematical induction (Nasrullah; Baharman, 2017) This learning approach is applied to support the learning process of students that a deductive approach through a model of online learning with the application Sevima Edlink.

The rising technology in the era of globalization which is applied in the world of education as more advanced facilities to simplify the process of learning delivered. The use of proven technology can improve the learning interest of students because a more attractive appearance. Before the onset of the pandemic Covid-19, most of the schools in Indonesia are still not using technology in education. However, after the onset of the pandemic Covid-19 some of the educational institutions, teachers, and parents who were initially reluctant to use the technology has changed as a result of the pandemic, because now almost all of the people depend on the method of education online and remote. The development of technology education became an important factor in solving the problems of education during the pandemic Covid-19. Virtual learning is learning utilizing the computer as a medium of learning by using the internet, intranet, or another computer network. The use of virtual media this can make the learning more effective (R. A. Pratiwi et al., 2020).

Sevima Edlink is one of the media-based android mobile nature of which is devoted to the world of education to help educators in the learning process. Some of the benefits Sevima Edlink for educators is to save time, keep classes organized, and improve communication with students or learners (Wibowo & Rahmayanti, 2020). With the features contained in the application Sevima Edlink this can support to improve the problem solving ability of mathematics students, because the features in the app Sevima Edlink more interesting and more well structured and can facilitate learners to access learning materials, so learning to apply virtual classroom Sevima Edlink is varied and can facilitate learners to focus more in observe what is delivered by the teacher and can improve the ability of mathematical problem solving of students. Based on this, the application class virtual Sevima Edlink with a deductive approach is expected to be changed online learning during the pandemic Covid-19 becomes better and effective and can build and enhance the problem solving ability of learners. Based on the description above, the researchers conducted the study to find out whether there are differences in student learning outcomes by applying the virtual classroom Sevima Edlink with a deductive approach to improving mathematics problem solving ability of students in class XI MA Unggulan KH. Abd. Wahab Hasbullah.

METHOD

The type of research used in this research is the method of experimental research. According to (Sugiyono, 2018) methods of experimental research is a research method carried out with the experiment, which is a quantitative method, is used to determine the effect of the independent variable (treatment/treatment) on the dependent variable (the results) in the conditions of that ungovernable. The purpose of this study is to measure the influence of the variable that is manipulated to the observed variables. The means used is to provide treatment to the experimental group and then compare the results with a control group who were not given the treatment. So, understanding the methods of experimental research is a quantitative research method which is used to to test or to find the effect of a treatment or the treatment of the subject of the research.

The design used in this research is *Quasi Experimental Design*. According to (Sugiyono, 2018) *Quasi-Experimental Design* have a control group, but can't be fully functional to control the variables-outside variables that affect the execution of the experiment. The design of this study using the design of non-equivalent control group design. According to (Sugiyono, 2018) Non-equivalent control group design with pretest-posttest control group design, it's just on this design the experimental group and the control group was not selected at random. The two classes were given a pretest, then given a different treatment, and the last were given a posttest. The design can be seen in figure 1 below:

Table 1. Research Design

Pretest	Treatment	Posttest
O_1	X	O_2
O_3	-	O_4

Keterangan :
O_1 = Pretest experimental group
O_2 = Posttest experimental group
O_3 = Pretest control group
O_4 = Posttest control group
X = Treatment by applying a virtual classroom Sevima Edlink using a deductive approach
\- = Without applying the method of virtual classroom Sevima Edlink using a deductive approach

This study was conducted in MA Unggulan K.H. Abd. Wahab Hasbullah, which is located at Jl. K.H. Abd. Wahab Hasbullah Tambak Beras (rear MTsN Tambak Beras) Desa Tambak Rejo Kec. Jombang Kab.Jombang Jawa Timur. The activities of this research was conducted in the even semester of the academic year 2020/2021 precisely on 20 March 2020 to 15 April 2021 online and offline.

The population in this research is all students of class XI MA Unggulan K.H. Abd. Wahab Hasbullah the academic year 2020/2021. In this study, the sampling technique used is *opportunity sampling*. *Opportunity sampling* is a sampling technique used to select the participants from the target group to take part in a research study. This consists of researchers choose anyone available and willing to take part in the research. Based on the sampling technique used, then the obtained class of MIPA 2 and IIA 2 as the research sample, each of which consists of 20 students. On the selection of the sample is to choose two classes with the provisions of teachers of mathematics the same. Class MIPA 2 as the experimental class and class IIA 2 as the control class.

The data collection technique used is the technique of the test. According to (Sugiyono, 2018) data collection techniques are the most important step in the study, because the main goal of the research is to obtain the data. In this study, the tests carried out is divided into two parts that tests the ability of the beginning (*pre-test*) and test the ability of the end (*post-test*).

The instruments used in this study, an instrument test in the form of a description that is a matter of pretest and posttest consisting of 5 items about each problem contains all the indicators of the ability of mathematical problem solving. The first step is before the treatment is given in the learning, learners are given the pre-test first to determine the condition of the initial ability of students, and after being given treatment learning by applying the virtual classroom Sevima Edlink then, learners are given the question post-test to know how the condition of the ability of the end and the differences in the ability of mathematical problem solving of students after being given the treatment.

Data analysis techniques in this study is made against the results of the data of pretest and posttest of the students which includes the analysis of the descriptive analysis and inferential analysis inferential to test the hypothesis using the *Independent-Sample t-test*, namely a two-party test, but the previous test

preconditions, namely normality test, homogeneity of variance, and then test the similarity of the average or test hypotheses.

RESULT AND DISCUSSION

Table 2. Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Pre-Test Eksperimen	20	55	76	67.50	5.754
Post-Test Eksperimen	20	70	90	81.85	5.887
Pre-Test Control	20	55	75	65.40	6.402
Post-Test Control	20	56	85	72.20	7.142
Valid N (listwise)	20				

Description of Pretest Data

Data on the learning outcomes of this cognitive aspect is data obtained from the results of pretest students. The provision of this pretest sheet is done in both sample classes, namely MIPA 2 class by applying Edlink Sevima virtual class using deductive approach and IIA 2 class without applying Edlink Sevima virtual class using deductive approach and learning as usual in the classroom using conventional method.

After the calculation of students' pretest learning results descriptively, in the experimental class obtained the lowest score of 55 and the highest score of 76 while in the control class obtained the lowest score of 55 and the highest score of 75. The average pretest score of both classes was 67.50 and the control class was 65.40. The standard deviation in the experimental class was 5.754 while in the control class it was 6.402.

Description of Posttest Data

Data on the learning outcomes of this cognitive aspect is data obtained from the results of student posttest. The posttest sheet was given in both sample classes, namely MIPA 2 class by applying Edlink Sevima virtual class using deductive approach and IIA 2 class without applying Edlink Sevima virtual class using deductive approach and learning as usual in the classroom using conventional method.

After the calculation of students' pretest learning results descriptively, in the experimental class obtained the lowest score of 70 and the highest score of 90 while in the control class obtained the lowest score of 56 and the highest score of 85. The average pretest score of both classes was 81.85 and the control class was 72.20. The standard deviation in the experimental class was 5.887 while in the control class it was 7.142. Furthermore, the data is compiled in frequency distribution and posttest analyzed with normality test, variance homogeneity test, and hypothesis test using *SPSS 16.0 for windows*.

Normality Test Results

Normality testing aims to determine whether the posttest results of the sample class in this study are normally distributed or not. In this study, normality testing was conducted using *Shapiro Wilk Tests* because the number of data samples used as many as 40 students which means the number of data is less than 50 learners. A data is said to be normally distributed when the calculation obtained significance value (Sig.) for all data in both *Kolmogorov-smirnov test* and *Shapiro-wilk test* > 0.05. The normality test on *Shapiro Wilk's* column can be seen in Table 2 as follows.

Table 3. Test for Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	Df	Sig.	Statistic	df	Sig.
Post-Test Eksperimen	.154	20	.200*	.940	20	.238
Post-Test Control	.103	20	.200*	.974	20	.832
a. Lilliefors Significance Correction						

Based on Table 2, it is known that the normality test of posttest data in the experiment class and control class shows that in the experiment class has a Value of Sig Shapiro Wilk Tests = 0.238 > 0.05 and in the control class has a value of Sig Shapiro Wilk Tests = 0.832 > 0.05. Thus it is known the conclusion that the posttest data of the research sample is normally distributed.

Homogeneity Test Results

After conducting a normality test on the results of posttest learning, a homogeneity test was conducted using the *One-Way Anova test*. The sample is said to have a homogeneous variant when the

Sig value > 0.05. The results of the *One-Way Anova test* can be seen in Table 3 as follows.

Table 4. Test for Homogeneity

Hasil Belajar Siswa			
Levene Statistic	df1	df2	Sig.
.423	1	38	.519

Based on the data obtained from the posttest results in the experiment class and control class shows that the Sig value of 0.519 > 0.05, so it can be concluded that the variance of the test class posttest data and the control class posttest data is a homogeneous variant.

Hypothesis Test Results

This hypothesis test uses *paired sample t test* which is part of comparative hypothesis test or comparative test. The *paired sample t test* aims to determine if there is an average difference between two samples that are paired or related. The results of the test *paired sample t test* can be seen in table 4 as follows.

Table 5. Test Paired Sample

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Pre-Test Eksperimen - Post-Test Eksperimen	-14.350	4.603	1.029	-16.504	-12.196	-13.942	19	.000

Testing criteria, if the Sig (2-tailed) value < 0.05, then Ho is rejected and Ha is accepted, on the contrary, if the Sig (2-tailed) value > 0.05, then Ho is accepted and Ha is rejected.

Ho : There is no influence on the application of Edlink Sevima virtual class in improving the math problem solving skills of grade XI MA Featured student Wahab Hasbullah.

Ha : There is an influence on the application of virtual classes Sevima Edlink in improving the problem solving skills of mathematics students of grade XI MA Featured Wahab Hasbullah.

Based on the output pair 1 obtained a $Sig._{count}$ (2-tailed) of 0.000 < 0.05 and a value of t_{count} 13.942 > t_{table} 2.093, then Ho was rejected and Ha accepted. So it can be concluded that there is an influence on the application of virtual classes Sevima Edlink in improving the math problem solving skills of grade XI MA Featured students Wahab Hasbullah.

Discussion

Based on the description of the results of the research and hypothesis tests that have been conducted shows that there is an influence on the application of virtual classes Sevima Edlink in improving the problem solving skills of mathematics students of grade XI MA Featured Wahab Hasbullah. This is shown from the results of the analysis using the Paired Sample t-test, where the t_{count} value (13.942) is greater than the value of t_{table} (2.093) at a significance level of 5%. In addition, there were differences in pretest and posttest learning outcomes that showed that the average experimental class learning outcome was greater than the control class. This is evidenced by the average results of the initial calculation at the time of pretest students in the experimental class of 67.50 while in the control class is 65.40. Then after the implementation of learning by giving different treatment in experimental classes and control classes, there are differences in learning outcomes in both classes. After being given a posttest the average score in the experimental class was 81.85, while the average score in the control class was 72.20.

From the calculation of SPSS obtained sig.menghitung value 0.00 with $\alpha = 0.05$. Thus it is clearly seen that the value of $Sig._{count}$ (0.00) < α (0.05). This is reinforced by the calculation a value of t_{count} 13.942 > t_{table} 2.093, with df = 19 at the level of significance of 0.05. Therefore, Ho stated that there was no influence between the application of Edlink Sevima virtual class to improve the math problem solving skills of grade XI ma superior students Wahab Hasbullah was rejected. Meanwhile, Ha stated that there is an influence between the application of virtual classes Sevima Edlink to improve the mathematical problem solving skills of students of grade XI MA Featured Wahab Hasbullah accepted.

Thus it can be concluded that there is influence between the implementation of a virtual classroom Sevima Edlink to improve the ability of mathematical problem solving of students of class XI MA

Unggulan KH. Abd. Wahab Hasbullah. The statement is in line with the results of the research conducted by (Asih et al., 2020), that there are differences in the ability of critical thinking mathematically between the experimental class and class control class VIII MTsN 1 Buleleng, the ability to think critically mathematically the experimental class is better than critical thinking skills mathematical control class, and the results of the description of the critical thinking skills of mathematical learners of the experimental class is better than students in the control class .

CONCLUSION

The results of the study in MA Unggulan KH. Abd. Wahab Hasbullah Jombang pointed out that there are differences in pretest and posttest learning outcomes which show that the average results of experimental class study are greater than the control class. And the results of the analysis using a Paired Sample t-test with a value of $Sig._{count}$ (0.00) < α (0.05) and reinforced by the calculation of $t_{count} > t_{table}$ (13,942 > 2.093) which means Ha was accepted and Ho rejected. Thus it can be concluded that applying Edlink Sevima virtual classes with a deductive approach affects students' math problem solving skills on derivative material.

REFERENCES

Ashar, A. M. I. T., & Nur, S. (2018). *Model Pembelajaran Problem Posing dan Solving Meningkatkan Kemampuan Memecahkan Masalah* (H. Wijayanti (ed.)). Sukabumi: CV.Jejak.

Asih, R., Alifiani, & Isbadar, N. (2020). Kemampuan berpikir kritis matematis menggunakan model pembelajaran e-learning berbantuan aplikasi sevima edlink. *JP3*, *15*(33), 46–57.

Chairani, Z. (2016). *Metakognisi Siswa dalam Pemecahan Masalah Matematika*. Yogyakarta: deepublish.

Depdiknas. (2008). *Peraturan Pemerintah RI No.19 Tahun 2005 tentang Standar Nasional Pendidikan*. Jakarta: Depdiknas.

Khotimah, K. (2017). Penerapan Model Problem Based Learning Dengan Pendekatan. *Eduscope*, *03*(02), 23–29.

Marlina, E. (2020). Pengembangan Model Pembelajaran Blended Learning Berbantuan Aplikasi Sevima Edlink. *Jurnal Padegogik*, *3*(2), 104–110. https://doi.org/10.35974/jpd.v3i2.2339

Nasrullah; Baharman. (2017). Pengaruh SMP Virtual terhadap Kemampuan Penalaran dan Komunikasi Siswa dalam Pembelajaran Matematika. *Proceedings of National Seminar : Research and Community Service Institute Universitas Negeri Makassar*, 662–666. https://ojs.unm.ac.id/semnaslemlit/article/view/4118

Polya, G. (1978). How to solve it: a new aspect of mathematical method second edition. In *The Mathematical Gazette* (Vol. 30, p. 181). http://www.jstor.org/stable/3609122?origin=crossref

Pratiwi, R. A., Hendrayana, A., & Ihsanudin, I. (2020). Pengembangan Kelas Virtual Dengan Gnomio Dalam Kecakapan Komunikasi Matematis Siswa Topik Transformasi. *Jurnal Cendekia : Jurnal Pendidikan Matematika*, *4*(1), 380–395. https://doi.org/10.31004/cendekia.v4i1.199

Pratiwi, Y. C. (2016). *Analisis Kemampuan Pemecahan Masalah Matematika Siswa Smp Dalam Pembelajaran Creative Problem Solving Ditinjau Dari Adversity Quotien*. 1–298.

Sugiyono. (2018). *Metode Penelitian Kuantitatif, Kualitatif, dan R&D*. Bandung:Alfabeta.

Suprapto, P. K., Ardiansyah, R., Diella, D., & Chaidir, D. M. (2018). Kreativitas Mahasiswa Dengan Pendekatan Deduktif Dan Induktif Pada Model Pembelajaran Wimba. *Jurnal Pelita Pendidikan*, *5*(4), 415–419. https://doi.org/10.24114/jpp.v5i4.8879

Satiti, W. S., & Verdianingsih, E. (2019). Penggunaan Scaffolding untuk Mengatasi Kesulitan Problem Solving Mahasiswa Calon Guru. *JMPM: Jurnal Matematika dan Pendidikan Matematika*, *4*(2), 113-127.

Wibowo, A., & Rahmayanti, I. (2020). Penggunan Sevima Edlink Sebagai Media Pembelajaran Online untuk Mengajar dan Belajar Bahasa Indonesia. *Imajeri: Jurnal Pendidikan Bahasa Dan Sastra Indonesia*, *2*(2), 163–174. https://doi.org/10.22236/imajeri.v2i2.5094