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THE EFFECT OF SELF-EFFICACY ON MATHEMATICAL COMMUNICATION ABILITY OF JUNIOR HIGH SCHOOL STUDENTS ON THE PYTHAGOREAN THEOREM Abstract This study aims to analyze and examine the mathematical communication ability that are influenced by junior high school students self-efficacy. The method in this study uses a correlational method with quantitative approach. The population in this study were students of junior high school in Cimahi City, with a sample of 36 students who were determined by purposive sampling technique at one of junior high school in Cimahi City.

The instrument used in this study is a communication ability test that consisting of 5 essays and a students' self-efficacy scale that consisting of 25 statements scales. The results showed that students communication ability was positively influenced by self-efficacy of 19.1%, while 80.9% was influenced by factors other than students' self-efficacy. The correlation between self-efficacy and mathematical communication skills of students is included in the medium category.

Keywords: Mathematical Communication, Self-Efficacy Abstrak Penelitian ini bertujuan untuk menganalisis dan menelaah secara mendalam tentang kemampuan komunikasi matematis yang dipengaruhi self-efficacy siswa. Metode dalam penelitian ini menggunakan metode korelasional dengan pendekatan kuantitatif. Populasi dalam penelitian ini adalah siswa SMP di Kota Cimahi dengan sampel sebanyak 36 siswa yang ditetapkan dengan teknik purposif sampling pada salah satu SMPvdi Kota Cimahi.

Instrumen dalam kemampuan ini berupa tes kemampuan komunikasi sebanyak 5 butir soal uraian dan skala self-efficacay siswa sebanyak 25 skala pernyataan. Hasil penelitian ini memperoleh kesimpulan bahwa, kemampuan komuniksi matematis siswa SMP pada

materi teorema pythagoras dipengaruhi positif oleh self-efficacy sebesar 19,1% sedangkan 80,9% dipengaruhi oleh faktor lain selain self-efficacy siswa. Korelasi antara self-efficacy dan kemampuan komunikasi matematis siswa termasuk dalam kategori sedang Kata Kunci: Mathematical Communication, Self-Efficacy _ _ INTRODUCTION Mathematical communication ability is one of the mathematical abilities that are very important, that must be possessed by students.

The National Council of Teachers of Mathematics (NCTM) sets five basic mathematical abilities that become standard, one of which is mathematical communication ability (Fahradina, Bansu, Ansari, & Saiman, 2014). This is stated in the 2004 curriculum and the Education Unit Level Curriculum (KTSP) and the 2006 National Education Standards Agency as confirmed by Sugandi & Sumarmo (Armania, Eftafiyana, dan Sugandi, 2018). The importance of having mathematical communication ability is reflected in the role of mathematics as a formidable, concise, solid, meticulous, precise, and not meaningful language of symbol and communication as stated by Wahyudin (Isnaeni, Maya, 2014).In addition, Ruseffendi (Rahmawati, Bernard, dan Akbar, 2018) stated that in mathematics the use of symbols and terms makes mathematical characteristics a language that we really need to understand and have agreed upon beforehand, so we need good communication skills in mathematics learning.

Based on the opinion analysis of a number of experts, Sumarmo (Hendriana, Sumarmo, dan Rohaeti, 2013) stated that mathematical communication ability include several abilities, including: the ability to express a situation into mathematical language, symbols, ideas, mathematical models; explain and read meaningfully, express, understand, interpret, and evaluate a mathematical idea and mathematical presentation verbally, written, or visually; listen, discuss and write about mathematics; and express an argument in its own language. It is hoped that through mathematical communication students will be able to exchange ideas and explain their ideas or understanding to their friends (Hidayat, Sumarmo, 2013).

In the context of mathematics, Sumarmo (Yuliani, 2015) identifies several indicators of mathematical communication ability such as: 1) Expressing a situation, picture, diagram, or real object into a language, symbol, idea or mathematical model; 2) Explain ideas, situations and mathematical relations verbally or in writing; 3) Listen, discuss and write about mathematics; 4) Reading with an understanding of a written mathematical representation; 5) Reveal a description or paragraph of mathematics in their own language.

Indicators of mathematical communication ability used in this study are indicators that have been modified by researchers, namely: 1) Linking images and diagrams into

mathematical ideas and or mathematical symbols; 2) Explain ideas, sites and mathematical relations in writing using images, graphics and algebraic expressions; 3) Expressing daily events in a language or mathematical symbol or compiling a mathematical model for an event; 4) Explain and make questions about mathematics that have been learned; 5) Making conjectures, compiling arguments, formulating definitions and generalizations.

The reason for using these indicators is because for junior high school students the ability to think the and cognitive stage of students still thinks concrete which requires illustrations of real-life reality. In the 2013 curriculum, hard skills and soft skills must be developed simultaneously and equally, but in different portions so that the goals of mathematics learning can be achieved optimally (Hendriana, Rohaeti, dan Sumarmo, 2017). One of the soft skills students must develop is mathematical self-efficacy. This is in line with the Regulation of the Minister of National Education No. 54 of 2013 concerning Graduates' Competency Standards for Primary and Secondary Education Units.

In mathematics learning self-efficacy is required to continue to be developed (Subandi, 2016) Learning can run well so that the desired goal will be achieved, if students feel comfortable and not depressed and have high self-efficacy (Juhrani, Suyitno, Khumaed, 2017). Self-efficacy is synonymous with self-confidence or self-confidence Somakin (Jatisunda, 2017). According to Bandura (Sunaryo, 2017), self-efficacy is a person's assessment of his ability to organize, control, and carry out a series of behaviors to achieve the desired outcome.

Based on these opinions it can be said that self-efficacy plays an important role for students in solving mathematical problems. Based on the explanation above, it is necessary to conduct research that becomes the urgency of the problem of how much mathematical communication skills are influenced by the self-efficacy of junior high school students. METHOD The method in this study is a correlational method with a quantitative approach that aims to analyze and examine in depth about mathematical communication skills that are influenced by the self-efficacy of junior high school students.

The population in this study were students of junior high school in Cimahi City, with a sample of 36 students who were determined by purposive sampling technique at one of junior high school in Cimahi City. The instrument used in this study is a communication ability test that consisting of 5 essays and a students' self-efficacy scale that consisting of 25 statements scales. The self-efficacy scale is answered by referring to the Likert scale. Students are asked to answer each statement by giving a checklist to one answer

that is available. Giving a Likert scale score there are four choices in the form of SS (strongly agree), S (agree), TS (disagree), and STS (strongly disagree).

The research was processed and analyzed using regression statistical tests. Prerequisite test for data analysis in this study, with a normality test. The normality test is done to find out whether the data sample from the population is normally distributed or not normal. The normality test is carried out based on the variables of self-efficacy and students' mathematical communication ability. The hypothesis for the normality test is the acceptance of H0 or the rejection of Ha with H0: Data is normally distributed and Ha: Data is not normally distributed The normality test statistic used is Kolmogorov-Smirnov with the help of SPSS version 19.

Furthermore, to find out the degree of correlation between variable X and Y, the level of relationship between these variables based on the interpretation of the correlation coefficient is shown in Table 1. Table 1. Interpretation of The Correlation Coefficient Coefficient Interval _Correlation Level _ _0,00 < r = 0,20 _Very low _ _0,20 < r = 0,40 _Low _ _0,40 < r = 0,60 _Enough _ _0,60 < r = 0,80 _High _ _0,80 < r = 1,00 _Very high _ _ The following are presented samples of test and non-test instruments in sequence Pay attention to the following picture! a c b Paying attention to the picture above show the equations that apply to the right triangle above.

Briefly explain your opinion! ABCD is a trapezoid with AB parallel to DC. If N is a point on AB such that the angle DNA = 900, DN = 12 cm, DC = 10 cm and AD = BC = 15 cm, a. Draw the situation above along with the information! b. Explain how you are looking for AN length _ _ Figure 1. Figure test instrument for students' mathematical communication ability Table 2. Samples of Mathematical Self-Efficacy Scale SS (strongly agree) TS (disagree) S (agree), STS (strongly disagree) No _Statement _Respons _ _ _ _SS _S _TS _STS _ _1 _I am sure I can finish the math assignments related to the Pythagorean Theorem well.

_ _ _ _ _ _2 _I am hesitant to answer the Pythagorean Theorem questions on the LKS sheet given by the teacher _ _ _ _ _ _3 _I avoid learning or math assignments given by the teacher. _ _ _ _ _ _4 _I was able to solve the Pythagorean Theorem questions in the form of drawing sketches. _ _ _ _ _ _ Figure 2. Figure instrument of self-efficacy scale RESULTS AND DISCUSSION Results Prerequisite test for data analysis in this study, with a normality test.

The normal test is done to find out whether the data sample is taken from a population normal distribution or not normal. Based on data processing it was concluded that self-efficacy and mathematical communication ability, data were normally distributed.

The results of the data normality test are presented in Table 3. Table 3. Self-Efficacy Normality Test and Mathematical Communication Ability Tests of Normality _ _ _Kolmogorov-Smirnova _ _ _Statistic _df _Sig. _ _Self-Efficacy _,133 _36 _,107 _ _Mathematical Communication _,121 _36 _,199 _ _Lilliefors Significance Correction _ _ Table 3 shows the significance of the Kolmogorov-Smirnov test data obtained that the two variables are normally distributed.

Then the linearity test of self-efficacy and mathematical communication ability of students were carried out with the results of the tests presented in Table 4. Table 4. The Linearity Test of Self-Efficacy And Mathematical Communication Ability ANOVA Table _ _ _Sum of Squares _df _Mean Square _F _Sig _ _ Self-Efficacy* Mathematical Communication _Between Groups _(Combined) _,134 _10 _,013 _1,555 _,178 _ _ _ _Linearity _,063 _1 _,063 _7,290 _,012 _ _ _ _Deviation from Linearity _,071 _9 _,008 _,918 _,526 _ _ _Within Groups _,215 _25 _,009 _ _ _ _ _Total _,349 _35 _ _ _ _ _ Table 4 shows the results of the linearity test between self-efficacy and students' mathematical communication ability, there is a linear relationship. This is evidenced by the value of the Sig Deviation from Linearity resulting in a value of 0.526 > 0.05.

Then it can be concluded that there is a linear relationship between self-efficacy and mathematical communication ability. Furthermore, regression statistical tests were conducted to see whether there was an effect of students 'self-efficacy on students' mathematical communication ability with the results of the tests presented in Table 5. Table 5. Regression Test Between Self-Efficacy and Mathematical Communication Ability ANOVAb _ _Model _Sum of Squares _df _Mean Square _F _Sig. _ _1 _Regression _,067 _1 _,067 _8,043 _,008a _ _ _Residual _,282 _34 _,008 _ _ _ _ _Total _,349 _35 _ _ _ _ _a.

Predictors: (Constant), B b. Dependent Variable: A _ _ The hypothesis for the regression test is the rejection of H0 or acceptance of H0, with H0: there is no significant effect of student self-efficacy on students' mathematical communication ability and Ha: there is a significant effect of student self-efficacy on students' mathematical communication ability. Table 4 shows the significance of 0.008 < 0.05, which means reject H0.

Thus, it can be concluded that there is a significant effect of student self-efficacy on students' mathematical communication ability. Furthermore, to find out the degree of correlation between self-efficacy on students' mathematical communication ability are presented in Table 6. Table 6. Correlation Coefficient Table Model Summaryb _ _Model _R _R Square _Adjusted R Square _Std. Error of the Estimate _Durbin-Watson _ _1 _,437a _,191 _,168 _,09108 _1,889 _ _a. Predictors: (Constant), Mathematical Communication b. Dependent Variable: Self-Efficacy _ _Table 6 the results of the analysis the correlation coefficient is 0.437 and the coefficient of determination is 0.191. This can be interpreted

that the data describing the self-efficacy of mathematical communication ability have a positive relationship.

Meanwhile, the correlation between self-efficacy and students' mathematical communication ability is included in the medium category, so it can be concluded that the higher the self-efficacy students have, the higher the mathematical communication ability of the students. Discussion Based on the results of the analysis of the data obtained, it can be seen that there is a positive influence between self-efficacy on students' mathematical communication ability. The causes of this positive influence include: (1) students who have a self-efficacy attitude in mathematics tend to be confident that they can complete math assignments, (2) students who have self-efficacy in mathematics tend to be more enthusiastic in working on challenging math problems.

Meanwhile, for students who have less self-efficacy in mathematics, they tend to be quick to despair in doing problems, avoiding, and giving up easily due to heavy mathematical assignments, so many students after learning simple math are not understood, even many concepts which are incorrectly understood as stated by Ruseffendi (Narpila, 2016). The work results of students with self-efficacy in mathematics are presented in Figure 3 and Figure 4. / Figure 3. The Work Results of Students with Good Self-Efficacy Attitudes / Figure 4. The Work Results of Students with Poor Self-Efficacy Figure 3, it is seen that students who have a self-efficacy attitude with a very good category.

The work results of students really understand the equations that apply to a right triangle, so students are able to solve the problem correctly. This shows that students have fully mastered the indicator of connecting images and diagrams into mathematical ideas and or symbols mathematics. Whereas in Figure 4, students who have self-efficacy attitudes with poor categories are seen. Students have written an equation that applies to a right triangle, but the student's answer is not correct. This is because students do not know and confused about what is meant by an equation in mathematics.

Seen students have not been able to explore and express mathematical ideas that they have optimally. This is in line with the research of (Juhrani, Suyitno, dan Khumaedi, 2017) which states that students who have moderate and low self-efficacy have not been able to express mathematical ideas optimally, and research Rahmi, Nadia, Hasibah, dan Hidayat (2017)which states that self-efficacy can affect mathematical communication ability because the higher the level of one's ability to mathematics the higher the mathematical communication ability it has.

CONCLUSION The results showed that students communication ability was positively

influenced by self-efficacy of 19.1%, while 80.9% was influenced by factors other than students' self-efficacy. The correlation between self-efficacy and mathematical communication ability of students is include in the medium category. ACKNOWLEDGMENTS The author says thank you to the supervisor who has guided, directed, and motivated the completion of this scientific article, as well as all those who have been involved in this research.

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