EFFECT OF SELF-EFFICIENCY ON DECISION MAKING IN SOLVING PROBLEMSOF MATH

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ABSTRACT

This study aim is to see whether there is influence self-efficacy of decision making in solving math problems of SMA Yogyakarta. This research is a quantitative research in which the data obtained by using self-efficacy questionnaire and questionnaire of decision-making in solving math problems given to high school students of Yogyakarta taken at random according to school level amounted to 390 students. Data collection using questionnaire instrument that has been tested its validity with product moment correlation and reliability test by using alpha-cronbach. The data analysis is done by descriptive and simple regression analysis with significant level 0.05. The results of the analysis stated that there is a significant effect of self-efficacy variables on decision-making variables with a significant level of 0.000 <0.05.

Keywords: *Self-Efficacy and Decision Making Math*

1. INTRODUCTION

Realizing the importance of mathematics, because mathematics is a science that plays an important role to face various challenges of life (Retnowati, 2017). Learning mathematics should be a need and a fun activity (Nurdalilah, without years). Mathematics is one of the most influential subjects on human life, in every activities and activities carried out everyday is not separated by mathematics. Therefore, it should be mathematics is learned by everyone for the purpose of carrying out its activities. Similarly for students, both elementary, middle and high school students must learn math. This is not just a lesson that must be followed only, but for their interests. In addition, students are expected to use mathematics and mathematical thinking in everyday life. It is same like in studying the various sciences that emphasis on the arrangement of reason and mathematical skills in solving everyday problems (Ariani, 2014).

Problem solving is an important skill to master, (Ariani, 2014). Mathematical problem solving generally involves some information. Where to get the settlement of the problem, can be done by connecting the information in the form of principles in mathematics. So in the process of learning students solve problems presented by digging information as much as possible, then analyzed and searched and decided the solution of the existing problems. The solution of the problem does not necessarily have one correct answer because often math problems are complex and can be solved. The problem is solved with various strategies or can also have many answers / open ended problem (Muhsinin, 2013).

Problem solving plays an important role in mathematics and must play an important role in mathematics education (Vendiagrys, 2015). The importance of mathematical problem solving skills is an important thing that must be possessed by someone (Purwosusilo, 2014). This is in accordance with what is proposed (Purwosusilo, 2014), problem solving is a basic ability in learning mathematics. This means that problem-solving ability is a matter of concern, given its very strategic role in developing students' thinking ability. Not only when learning mathematics in everyday life is also a very necessary capability because in everyday life we are also often faced with problems.

According Nuralam (2009) the initial step of the problem-solving process is that students are required to understand the problem given, without any understanding of the problem, then students will not be able to solve the problem. If the student has been able to understand the problem, the next step is to devise a plan of problem solving. After that, the next step by running the plan. At this stage students examine the truth of each step that has been passed and prove that the selected step is right. In the last step, the students do a re-examination of the process and the results of problem solving. This can be done by checking whether the answers found can be searched in different ways. In fact, the problem-solving process is still ineffective because in the process it is still centered on the teacher, so the students only accept it instead of finding a strategy in the decision-making solution or solving the math problem (Suardani, 2014). Self-efficacy is urgently needed to live a thing that will be necessary so that one does not give up in the face of problems that arise after making a decision (Tjiong, 2014).

Decision theory is the study of principles and algorithms used for decision making. This is achieved by identifying values, uncertainties and other matters that might influence the decision (Ahmed, 2012). Likewise in self-efficacy learning process is the most important (Ghufron, 2013). This self-efficacy describes how one views his or her abilities when faced with problems (Galyon, 2012). One can firmly convey what he knows, can easily solve the problems he is facing and to do something like solve math problems. A person who has high self-efficacy will be confident to be able to do something he or she will do. Self-efficacy will determine how a person exhibits certain behaviors, endurance in the face of adversity or failure and how success or failure can affect behavior (Bandura, 1997).

Self-efficacy towards a career is needed by someone in taking a decision (Wulandari, 2012). Therefore the belief in the choices taken is very important. This is what makes this research important to study, so in solving math problems, self-efficacy is needed. Research conducted by Tjiong (2014) on the relationship between self-efficacy and decision-making lectures in other cities. The results show, the more certain the individual will be his ability, the better the decision-making ability he possesses. Based on his research, individuals who have poor decision-making caused by individuals who have poor self-efficacy. Because of this, the data suggests that there is an effect of self-efficacy with good decision-making ability.

Complex and non-routine mathematical completion, students need to decide on the right problem-solving steps and the most accurate strategies. Allegedly, students who have low efficacy then in making poor decisions especially make decisions in solving math problems, consequently lack of high scores. To prove this assumption, this study was undertaken to confirm the effect of self-efficacy on decision-making attributed in mathematical problems.

The author can formulate, "Is there any effect of self-efficacy on decision making in solving math problems", so the authors are interested to conduct research with the title: "Effect of Self Efficacy on Decision Making in Solving Mathematics Problems Linear Inequality Two Variables of SMA Yogyakarta students". The purpose of this study is to determine whether there is influence of self-efficacy to decision making in solving math problems. As for self-efficacy measure, decision making in solving math problem is using questionnaire.

Theoretical Review Decision-making

Decision-making is the result of a solution in a problem that must be dealt with firmly. It can also be said that the decision is actually the result of a thought process in the form of selection of one of several alternatives that can be used to solve the problems it faces. According to George R. Terry 2000, decision-making is the choice of certain behavioral alternatives of two or more alternatives, (the leader's actions to solve the problems faced within the organization he leads through the election of one of the possible alternatives.

According to George R. Terry 1998 the basics of decision making are:

a. Intuition
b. Experience.
c. Authority
d. Fact
e. Rational.
f. Problem Solving

Mathematics learning for students is the formation of mindset in understanding an understanding as well as in reasoning a relationship between the meanings. In learning mathematics, students are accustomed to gain understanding through experience of the properties possessed and which are not possessed of a set of objects (abstractions). Students are given the experience of using mathematics as a tool for understanding or conveying information for example through equations, or tables in mathematical models that are simplifications of story problems or other mathematical descriptions.

Self-EfficacyAccording to Bandura (1997) self-efficacy is a person's perception of the ability he has to achieve a certain goal. Bandura (1997, in Friedman &Schustack, 2008), says that self-efficacy is the expectation of a belief about how far one is capable of performing one behavior in a given situation. A person who has positive self-efficacy will be confident to be able to perform a behavior in question. Self-efficacy will determine how a person exhibits certain behaviors, endurance in the face of adversity or failure and how success or failure can affect our behavior in the future.

Self-efficacy that refers to the belief in the ability of a person to succeed in a given task (Bandura, 1997), encourages individuals to choose more challenging and more enduring tasks in the face of such challenges (for review, Bandura & Locke, 2003).Bandura (1997) self-efficacy has several dimensions that have important implications on performance, meaning that self-efficacy is specific in tasks and situations faced by 3 dimensions, namely:

1. Level is a level of someone in believing effort or action that can be done. This dimension relates to the degree of difficulty of the task when the individual feels able to do so. The level dimension relates to the degree of difficulty of the task and refers to the degree of difficulty of the task that the individual believes will be able to overcome. The level of self-efficacy of a person differs from one another because of the degree of difficulty of a task, whether difficult or easy will determine the efficacy of self (Bandura, 1998: 42). This level of confidence will affect the selection of activities, the number of businesses, and the endurance of students in dealing with and completing the tasks they live. On a task or activity, if there is not a significant obstacle to overcome, then the task will be very easy to do and everyone must have high self-efficacy on this issue.

2. Strength is a belief in the ability of self to survive and trying to find a settlement in doing something. This dimension is usually related to the level dimension, ie the higher the difficulty level of the task, the weaker the perceived confidence to solve it. Weak self-efficacy can be easily eliminated with a disturbing experience when faced with a task. Conversely, a person with a strong conviction will persevere in his efforts, even on infinite challenges and obstacles.

3. Generality is how one can use self-efficacy in different situations. This dimension is concerned with the wide range of areas of behavior in which the individual feels confident of his or her ability to perform tasks in various activities. Various activities require individuals to be confident in their ability to perform such tasks or activities, whether the individual feels confident or not. Individuals may be confident in the ability of many fields or only certain areas. For example, a student is confident in a mathematics course, but he is not convinced of his ability in English subjects.

2. METHODS

The population of this study is 12,916 students of grade X SMA Yogyakarta. Based on the Slovin'sformulation (Sevila, 1993) with 5% error rate is 390 students aged about 16-17 years to be sampled. The location of this research is conducted in SMA Negeri 1 Wonosari, SMA Negeri 1 Yogyakarta, MAN GandekanBantul, MANWonosari. This type of research is an ex-post facto research, meaning that this research reveals existing data without providing treatment or manipulation of research variables, but reveals facts based on measurements of symptoms that already exist in the respondents. In this study using the type of quantitative research methods that can be interpreted as research methods used to examine the population and specific samples, sampling techniques are generally random, data collection using research instruments, data analysis is quantitative or statistical with the aim of testing the hypothesis that has beenset.

3. FINDINGS AND DISCUSSION

Based on hypothesis test done by using simple regression analysis with stepwise method, got result of research indicate that value of significance equal to 0.000 (p <0.05) and value of regression coefficient (R) equal to 0.812. These results indicate that the hypothesis is accepted, there is a significant relationship between self-efficacy and decision making. From the results of simple regression analysis obtained the equation of the regression line is $Y = a + bX$ or $17.987 + 0.574X$. Based on the regression line equation obtained can be seen that decision-making influenced self-efficacy.

Table 3.1
Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.449[a]	.202	.200	3.16991

a. Predictors: (Constant), JE
b. Dependent Variable: JP

The table above explains the value of correlation / relationship (R) that is equal to 0.449. From the output obtained coefficient of determination (R2) of 0.202, this implies that the influence of self-efficacy variables on decision making is 20.0% while the rest is influenced by other variables.

Table 3.2
ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	985.783	1	985.783	98.104	.000[a]
	Residual	3898.753	388	10.048		
	Total	4884.536	389			

a. Predictors: (Constant), JE
b. Dependent Variable: JP

This table explains that there is a significant influence of self-efficacy variables on decision-making variables. From the output, it can be seen that F count = 98.104 with a significant level of 0.000 <0.05 then the regression model can be used to predict decision-makingvariables.

Table 3.2
Coefficients[a]

| Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	14.117	1.452		9.721	.000
	JE	.239	.024	.449	9.905	.000

a. Dependent Variable: JP

In the Coefficients table in column B in constant (a) is 14.117, while Trust value (b) is 0.239, so the regression equation can be written:

Y = a + bX or 14.117 + 0.239X

Based on the equation can be translated:
1. Constanta of 14.117 states that if there is no Trust value then the decision variable value 14.117
2. Regression coefficient X of 0.239 states that each addition of 1 Trust value, then the value of decision making of 0.239

Normal P-P Plot of Regression Standardized Residual

Dependent Variable: JP
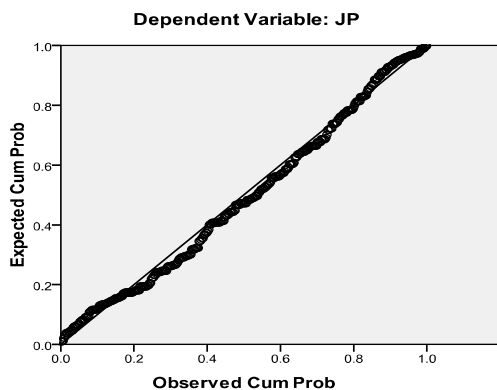
Testing of residual normality can be seen from normal graph of P-P Plot. If each residual data stream is in a straight line, it is said that the residual follows the normal distribution function. Based on the normal graph of P-P Plot, it is known that the residual scattering is in a transverse straight line

4. CONCLUSION
Based on the research that has been done by using simple linear regression analysis proved that there is influence self-efficacy to decision making in solving math problem at student of SMA Yogyakarta.

BIBLIOGRAPHY
Ahmed, M. T. O., H. (2012). Theories And Strategies of Good Decision Making. *INTERNATIONAL JOURNAL OF SCIENTIFIC & TECHNOLOGY RESEARCH, Volume 1*.

Alwisol. (2009). *Psikologi Kepribadian*. Malang: UMM Press.

Ariani, D. C., C. Marhaeni, M. (2014). Pengaruh Implementasi Open-Ended Problem dalam Pembelajaran Matematika terhadap Kemampuan Pemecahan Masalah dengan Pengendalian Kemampuan Penalaran Abstrak. *e-Journal Program Pascasarjana Universitas Pendidikan Ganesha, Volume 4*.

Bandura, A. (1986). *Social foundations thought and action a social cognitive and theory practice*. Hall inc: New Jersey.

Bandura, A. (1997). *Self-Efficacy: The Exercise of Control*. New York: NY: W.H Freman Company.

Bandura, A. (2006). *Guide For Constructing Self-Efficacy Scales*: Self-Efficacy Beliefs of Adolescents, 307–337

Beach, L. R. C., T. (2005). *The Psychology of Decision Making*. United States of America: Prentice-Hall Inc.

Cervone, D. P., L. A. (2012). *Kepribadian Teori dan Penelitian*. Jakarta: Salemba Humanika.

Creswell, J., W. (2010). *Research Design Pendekatan Kualitatif, Kuantitatif, dan Mixed*. Yogyakarta: Pustaka Pelajar.

Evans, J. R. (1991). *Creative Thinking In the Decision and Management Sciences*. Jakarta: Bumi Aksara.

Feist, J. F., G.J. (2010). *Teori Kepribadian Buku 2*. Jakarta: Salemba Humanika.

Florence, J., Peilouw, M., & Nursalim. (2013). Hubungan antara Pengambilan Keputusan dengan Kematangan Emosi dan Self-Efficacy pada Remaja. *Psikologi, Fakultas Ilmu Pendidikan, Universitas Negeri Surabaya*.

Galyon, C. E. B., C.A. Yaw, J. S. Nalls, M. L. Williams, R. L. (2012). The relationship of academic self-efficacy to class participation and exam performance. *Soc Psychol Educ, 15:233–249 DOI 10.1007/s11218-011-9175*.

Gaspersz, V. F., A. (2011). *Integrated Management Problem Solving* Bogor: Vinchristo Publication.

Ghufron, M. N. S., R. R. (2013). Efikasi Diri dan Hasil Belajar Matematika Meta-analisis. *BULETIN PSIKOLOGI, Volume 21, No. 1*, 20–30.

Gurcay, S. S. (2003). The Analysis of Decision Making Behaviors and Perceived Problem Solving Skills in Adolescents. *Journal of Educational Technology, volume 2 Issue 2 Article 5*.

Hasan, M. I. M. M. (2002). *Pokok-Pokok Materi Teori Pengambilan Keputusan*. Jakarta: Ghalia Indonesia.

Jonassen, D. H. (2004). *Learning to Solve Problems*. America: Pfeiffer.

Kaur, B. H., Y. B. Kapur, M. (2009). *Mathematical Problem Solving* Singapore: World Scientific Publishing.

Mahmudi, H. S. (2014). Efikasi Diri Dukungan Sosial Dan Penyesuaian Diri Dalam Belajar. *Jurnal Psikologi Indonesia, Vol.3 No:2*, 183-194.

Muhsinin, U. (2013). Pendekatan Open Ended pada Pembelajaran Matematika. *journal Edu-Math, Vol. 4*.

Ningrum, S. K., & Ariati, J. (2012). Relationship Between Self-Efficacy with Career Decision Making in Final Semester Students Diponegoro University's Faculty Of Economics and Business *Faculty of Psychology*.

Nuralam. (2009). Pemecahan Masalah Sebagai Pendekatan dalam Belajar Matematika. *Jurnal Edukasi, 5*, 142-154.

Nurdalilah, S. E. A., D. (tanpa tahun). Perbedaan Kemampuan Penalaran Matematika dan Pemecahan Masalah pada Pembelajaran Berbasis Masalah dan Pembelajaran Konvensional di SMA Negeri 1 Kualuh Selatan. *Jurnal Pendidikan Matematika PARADIKMA, Vol 6 Nomor 2*, hal 109-119.

Purnomo, R. L., S. (2010). Pengaruh Kepribadian, Self-Efficacy, dan Locus of Control Terhadap Persepsi Kinerja Usaha Skala Kecil dan Menengah. *Jurnal Bisnis dan Ekonomi (JBE), Vol. 17, No. 2*, Hal. 144 – 160.

Purwosusilo. (2014). The Mathematical Comprehension And Problem Solving Skills Of Vocational Students Through React Learning Strategy (An Experimental Study In SMKN 52 Jakarta). *Jurnal Pendidikan dan Keguruan, Vol. 1 No. 2*.

Putri, R. I. S., R.H. (2015). Keefektifan Strategi React Ditinjau dari Prestasi Belajar, Kemampuan Penyelesaian Masalah, Koneksi Matematis, Self Efficacy. *JURNAL RISET PENDIDIKAN MATEMATIKA, Volume 2 , Nomor 2*, 262-272.

Ramanigopal, C. S. A., B.R. (2008). Self-Esteem and Decision Making Styles of School Teachers. *Journal of the Indian Academy of Applied Psychology, Vol. 34*(Special Issue), 145-150.

Reed, A. E. M., J. A. Lockenhoff, C. E. (2012). Choosing with confidence: Self-efficacy and preferences for

choice. *Judgment and Decision Making, Vol. 7, No. 2*, pp. 173–180.

Retnowati, E. A., A. (2017). Efektivitas Strategi Pengelompokan Berpasangan dalam Pembelajaran Matematika Model Core. *Cakrawala Pendidikan No.1*.

Salusu, M. A. (1996). *Pengambilan Keputusan Stratejik*. Jakarta : Grasindo.

Santrock, J. W. (2014). *Psikologi Pendidikan Edisi 5-Buku 1*. Jakarta: Humanika.

Skaalvik, E. M. F., R. A. Klassen, R. M. (2016). Mathematics achievement and self-efficacy: Relations with motivation for mathematics. *International Journal of Educational Research, 72*, 129-136.

Stevens, S., P. (2015). *Mathematical Decision Making: Predictive Models and Optimization*. America: The Great Courses.

Suardani, N. N. B., I. Widiyanti, N. L. P. M. (2014). Pengaruh Model Pembelajaran Berbasis Masalah terhadap Kemampuan Pemecahan Masalah dan Keterampilan Proses Sains Siswa. *e-Journal Program Pascasarjana Universitas Pendidikan Ganesha, Volume 4*.

Sugiyono. (2015). *Metode Penelitian Kuantitatif, Kualitatif, Dan R&D*. Bandung: Penerbit Alfabeta.

Syamsi, I., S.U. (2000). *Pengambilan Keputusan dan Sistem Informasi*. Jakarta: Bumi Akasara.

Terry, G. R. R., L. W. (1992). *Dasar-Dasar Manajemen*. Jakarta: Bumi Aksara.

Tjiong, Y. W. (2014). Hubungan antara Self-efficcay dan Pengambilan Keputusan Berkuliah di Lain Kota. *jurnal imliah universitas surabaya, volume 3, Nomor 1*.

Vendiagrys, L. J., I. Masrukan. (2015). Analisis Kemampuan Pemecahan Masalah Matematika Soal Setipe Timss Berdasarkan Gaya Kognitif Siswa pada Pembelajaran Model Problem Based Learning. *Journal of Mathematics Education Research*.

Wagiran. (2013). *Metodologi Penelitian Pendidikan (Teori dan Implementasi)*. Yogyakarta: Deepublish.

Wright, G. (1952). *Behavioral Decision Making*: City of London Polytechnic London, England

Wulandari, E. R. (2012). Hubungan antara Work Family Conflict dan Big Five Personality dengan Career Self-Efficacy. *Jurnal Imliah Mahasiswa Universitas Surabaya, Vol.1, No.1*.