

Metacognitive Skills and Grade Point Average

Herry Agus Susanto, Erika Laras Astutiningtyas and
Veronika Unun Pratiwi

Veteran Bangun Nusantara University of Sukoharjo

Abstract

The objective of this study is to determine the regression model to describe the correlation between metacognitive skills and Grade Point Average. Type of the researches descriptive correlational. Method of collecting data uses the test method to determine score of metacognitive skills and methods of documentation to determine Grade Point Average. Analyzing data was conducted by curve fitting with linear regression approach, logarithmic, quadratic, and exponential. Determination of a regression model was conducted by using Software PASW Statistics 18. After having obtained the results of curve fitting of each model, then it is determined the most appropriate model. After having obtained a regression model, it will be continued by significance test of correlation using Analysis of Variance and significance test of correlation coefficient using t-test. The result of this research is the most appropriate curve model to describe correlation between metacognitive skills and Grade Point Average is quadratic models namely $= 4.744 + 0.183x + 0.004x^2$ with $R^2 = 0.920$. Anova and t-test showed that there is a significant correlation between the two variables and coefficients in the model $= 4.744 + 0.183x + 0.004x^2$ significant.

AMS subject classification:

Keywords: Metacognitive skills, student achievement index.

1. Introduction

Based on the research of metacognition and metamemory, the students in college do not present an overconfidence in their self-chosen strategies such as in optimistic picture that has connected to their academic performance [1], as far as the correlations between the self-predicted and actual performance that can be seen on the exams and also found on the other learning assessments [2].

That is a pattern which might be apparent in the students'™ low performing [3]. This is a dilemma for the highlights in decide the allocation of attention and time for the

students' studying: if the students are not correctly and accurate in their estimating, especially in their own learning and knowledge then they will not be able to make a choice about the strategies to improve the area that consider weakly represented. In compounding the matter further, it is necessary needed a prerequisite for choosing a good strategy that is the basic metacognitive knowledge about which the students' learning strategies are advantages for their long term memory. We can see on an open ended survey questions that considering such strategies, that college students most frequently reported in "rereading notes or textbook" [4]. The same like [5] it was found that most students reported reading and highlighting is an important concept, then after reviewing whatever they had highlighted. Importantly, in both studies, concluded that most students failed to mention a variety of techniques that have been shown to be an effective in important research; when empirically supported techniques were listed, they were ranked relatively low [4]

Research of [6], shows that through the implementation of the American Revolution, students are able to use their metacognitive skills in learning, while application of direct learning allows teachers to predict what will be learned more and better. Research shows how the curriculum provides opportunities for students to learn and do implementation metacognitive skills that can help students to understand the causal relationship of a case. Based on these studies can be said that there is the possibility of metacognitive skills affect the way students understand the material and troubleshoot problems during the learning process. The findings of the research that has been done by [7] support the use of offline-metacognition assessment instrument to distinguish mathematical problem solving ability of students. Therefore, it can be said that metacognitive score can reflect problem solving abilities.

Research of [8] result overall suggested an inability to predict the learning outcomes of educational scenarios describing the strategies of dual-coding, static-media presentations, low-interest extraneous details, testing, and spacing; there was, however, weak endorsement of the strategy of generating one's own study materials. In addition, an independent measure of metacognitive self-regulation scenario was correlated with performance. Next results demonstrated higher prediction accuracy for targeted students who had received instruction on topics in their memory applied psychology courses, and the best performance for students Directly Reviews those exposed to the original empirical studies from the which the scenarios were derived. In sum, this research Suggests that undergraduates are largely unaware of Several specific strategies that could benefit memory for course information; further, training in applied learning and memory topics has the potential to improve metacognitive judgments in These domains. [9] gives the result that there is a correlation between score of metacognition Awareness Inventory with Grade Point Average. Metacognition Awareness Inventory is a test to determine the metacognitive skills. This research will be conducted to determine the profile of the thought processes of students in problem solving. This is intended to get a description, if later needed a lesson that is able to increase metacognitive skills. [10] describes the definition of Schraw & Dennison on metacognition as the ability to reflect, understand and control learning.

Table 1: Summary of Analysis of Variance on the significance Regression Testing

SV	JK	Db	RK	Fobs	Ftable
Regresi	JKR	1	RKR	$F = \frac{RKR}{RKG}$	$F_{(\alpha,1,n-2)}$
Galat	JKG	n-2	RKG		
Total	JKT	n-1			

2. Research Method

Accordance with the objective of research, this research belongs to the descriptive cor-relational research that provides descriptive information about the status of existing symptoms. Two things will be investigated the correlation is metacognitive skills and Grade Point Average. This research uses the test instrument metacognition Awareness Inventory (MAI) developed by Schraw. The population of this research was all students of VIII semester of Veteran Bangun Nusantara University of Sukoharjo. The sampling technique used in this study is a random sampling, were finally selected as much as 37 students. First instrument is a test to determine the score of metacognitive skills. This study uses the test instrument metacognition Awareness Inventory (MAI) [11]. Data is about Grade Point Average that derived from the documents possessed by students.

Data Analysis Techniques

Data analysis process is begun by conducting curve fitting to score metacognitive skills and Grade Point Average. Approach model that is used is linear, quadratic, logarithmic, and exponential. After having obtained some regression models, it will be conducted test of regression significance. [12] stated that the regression coefficient is called meaningful (significant) if the value are not zero. The strength of the relationship between X and Y is expressed by the correlation coefficient. The coefficient of linear correlation between X and Y, served with r_{xy} , which is defined as follows.

$$r_{xy} = \frac{n \sum XY - (\sum X)(\sum Y)}{(n \sum X^2 - (\sum X)^2)(n \sum Y^2 - (\sum Y)^2)}; x = X - \bar{X} \text{ and } y = Y - \bar{Y}. \quad (1)$$

[12] explained that to see the significance (or significance) regression, is used approach of variance analysis with using JKT, JKR, and JKG. Hypotheses used are: (1) H_0 : the relationship between X and Y is not significant, and H_1 : the relationship between X and Y is significant. Significance level that is use damount 5%. Table of summary analysis of variance is as follows.

Regional criticism (DK) of the test is $\{F \mid F > F_{(\alpha,1,n-2)}\}$. Furthermore, it is conducted test of significance correlation coefficient linear with t-test statistic = $\frac{r_{xy}\sqrt{n-2}}{\sqrt{1-r_{xy}^2}} \sim t_{(\alpha,n-2)}$. Above all statistical tests will be conducted with software PASW

3. Results

Result of curve fitting from the data metacognitive skills scores and Grade Point Average student with approach of linear regression, quadratic, logarithmic, and exponential presented in detail in Table 2. Figure curve fitting models of the fourth approach can be seen in Figure 1.

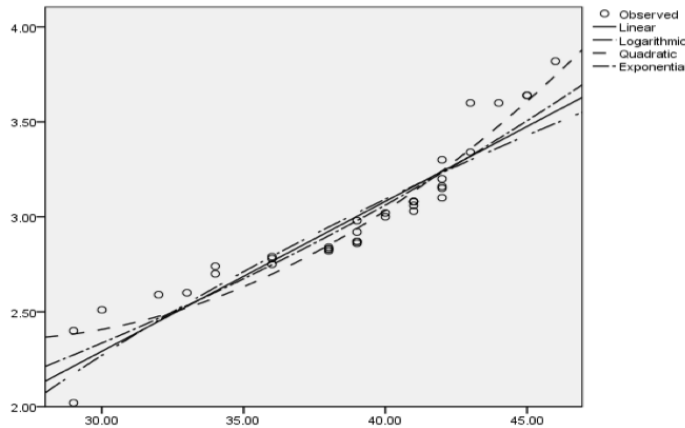


Figure 1: Model curve fitting
Y=Dependent Variable: Grade Point
X=Independent variable: Score Metacognitive Skills

Table 2: Model Summary and Parameter Estimates

Equation	Model Summary					Parameter Estimates		
	R2	F	df1	df2	Sig.	Constant	b1	b2
Linear	0.876	246.853	1	35	0	-0.075	0.079	
Logarithmic	0.847	193.765	1	35	0	-7.447	2.857	
Quadratic	0.92	196.367	2	34	0	4.744	-0.183	0.004
Exponential	0.894	294.831	1	35	0	1.036	0.027	

Based on Table 1 obtained information that the regression model is most appropriate to describe the correlation between the scores of metacognitive skills with grade point average is quadratic models because it has the greatest value of R^2 . The general form of regression models, namely $\hat{y} = a_0 + a_1x + a_2x^2$ with the value $a = 4.744$, $a_1 = -0.183$ and $a_2 = 0.004$. The regression model obtained is $\hat{y} = 4,744 - 0,183x + 0.004x^2$. Having obtained the regression model to describe the correlation between the two variables, data analysis followed by testing the significance of correlations using statistical test Analysis of Variance (Anova). The summary of Anova can be seen in Table 3.

In Table 3 shows that the correlation between the scores of metacognitive skills with a GPA of students is significant. After testing the significance of the correlation, the next

Table 3: Anova

Equation		Sum of Squares	Df	Mean Square	F	Sig.
Quadratic	Regression	4.521	2	2.260	196.367	.000
	Residual	.391	34	.012		
	Total	4.912	36			

test is the test of significance of correlation coefficients using the t-test. Summary of test results can be seen in Table 4.

Table 4: Significance of Regression Coefficients Test

Equation	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
Quadratic	-.183	.060	-2.173	-3.039	.005
	.004	.001	3.116	4.358	.000
	4.744	1.117		4.246	.000

Significance test of regression coefficients showed that the correlation coefficients of quadratic regression model was significant, means that the coefficients of the regression model $\hat{y} = 4,744 - 0,183x + 0.004x^2$ have significantly contributed to.

4. Discussion

Research that conducted [9] gives the result that there is a correlation between metacognition score Awareness Inventory (MAI) with student achievement index. This is consistent with research showing that there is a significant correlation between metacognitive skills of students as measured by MAI index test with student achievement. The new findings obtained from this study is the most appropriate regression model to describe the relationship of the two variables is $\hat{y} = 4,744 - 0,183x + 0.004x^2$ with x is the score of metacognitive skills and y is Grade Point Average.

[6] explains that metacognitive skills can help students to understand the causal relationship of an event. Therefore, implicitly it can be said that the metacognitive skills affect the way students understand the material and troubleshoot problems during the learning process. This is also consistent with the results of this study indicate that there is a significant correlation between metacognitive skills with student achievement index with quadratic models.

The results of the above study can be represented with the statement that scores of metacognitive skills can provide a picture of students' ability to solve problems. The impact is of the higher metacognitive skills score, higher Grade Point Average. These

results are consistent with the results of research conducted [7]. Strengthening in this study was the effect of metacognitive scores on Grade Point Average is quadratic.

5. Conclusion

The result of this research is most appropriate curve model to describe the correlation between metacognitive skills and Grade Point Average is quadratic models $\hat{y} = 4,744 - 0,183x + 0.004x^2$ with x is the score of metacognitive skills and y is a Grade point students The correlation coefficient of the regression model is $R^2 = 0.920$ which is the largest compared to the value of R^2 other approaches. Analysis of variance showed that there is a significant correlation between the two variables. The results of t-test to test the significance of the coefficients of the regression model coefficient in the model $\hat{y} = 4,744 - 0,183x + 0.004x^2$ significant.

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