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The effects of professional competency and the work motivation to the work performances of science teacher (the survey of science teachers in junior high school)

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Abstrak. Kinerja erat kaitannya dengan ketrampilan, kompetensi perilaku, pengetahuan dan juga motivasi. Penelitian ini mencari hubungan antara kompetensi professional dan motivasi yang guru miliki. Menggunakan analisis jalur, survei ini menunjukkan hasil adanya pengaruh langsung yang signifikan antara kompetensi professional terhadap kinerja sebesar 28.2% dengan nilai t_{hitung} = 1.924 > t_{table} = 1.686. Ada pengaruh langsung yang signifikan antara motivasi dan kinerja sebesar 39.8% dengan nilai t_{hitung}= 2.179 > t_{table} = 1.686. Ada pengaruh langsung yang signifikan antara kompetensi professional dan motivasi sebesar 38.7% dengan nilai t_{hitung} = 2.591 > t_{table} = 1.686. Ada pengaruh tidak langsung secara signifikan antara kompetensi professional terhadap kinerja melalui motivasi dengan koefisien jalur 15.4% dan nilai t_{hitung} = 1.063 > t_{table} = 1.687. Kinerja dapat dipengaruhi secara signifikan baik secara langsung oleh kompetensi professional dan motivasti kerja serta secara tidak langsung oleh kompetensi professional melalui motivasi kerja.

Kata kunci : Kinerja, motivasi, kompetensi professional, analisis jalur.

Abstract. The performance is related to skill, competency behavior, knowledge, and motivation. This study about surveying the relationship between professional competency, and motivation that teachers have to the work performances. Using path analysis, the survey results in there is a significant direct effect between professional competency to the work performed e as 28,2% and proved by t_{score} = 1.924 > t_{table} = 1.686. There is a significant direct effect between motivation and work performance as 39, 8% and proved by t_{score} = 2.179 > t_{table} = 1.686. There is a significant direct effect between professional competency to the motivation as 38.7% and proved by t_{score} = 2.591 > t_{table} = 1.686. There is a significant indirect effect between professional competency to the work performed through the motivation with the value of path coefficient 0.154 or 15.4% and proved by t_{score} = 1.063 > t_{table} = 1.687. The work performance can be effected significantly both by motivation and by professional competency directly and significantly by indirect effect professional competency through the motivation.

Keywords: Work performance, motivation, professional competency, path analysis.

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▪ INTRODUCTION

Education as a system that consists of some components are related to each other, can be separated and effected each other, all of it is proposed to reach the same goals. Teachers and principals determine the value of the component without ignoring the other cavity in the school. The teacher is an educator that lived in the school environment. The regulation in Indonesia No 14 the year 2005 about teachers and lectures states that the teacher is a professional educator with the main job is educating, guiding, training, giving value and evaluating the students in formal education, non-formal education, elementary education, and secondary education.

It has been discussed in 2 years recently about the effect of motivation to the work performance and also professional competency to the work performance of science teacher, but no one research about the correlation between motivation and professional competency to the work performance, moreover the analysis method that used is path analysis. In path analysis, the correlation between one independent variable is investigated to the dependent variable through the other independent variable. That is why this research is the enrichment and advance analysis of the effect of professional competency to the work performance through work motivation. In another word, the key in this research is looking for the direct and indirect effect between variables.

A teacher must have competencies to be said professional. The competencies are pedagogic, professional in academics, behavior, and social. In the education process, a teacher has to transform the values and builds the characters instead of teaching; in order, the students will have intellectual intelligence and also good behavior and being cultured. A professional teacher must have the ability to dig all information in the education field and the streaming field from many resources, including electronic resources, scientific conferences, and research to support the teaching-learning activity. Based on government regulation No 14 the year 2008, the specific competency that the teacher must have is professional in academics. The term professional in this field is the ability of teachers in mastering the lesson comprehensively.

To set up the goals in the education field, a teacher must have high work performance. Work performance can be defined as the work related to the activities expected of an employee and how well those activities were executed. Another definition of work performance is the ability of someone based on knowledge, behavior, and motivation to generate something. Work performance matters in management because it relates to the productivity of an institution or organization. There are so many factors related to the work performance of the teacher. Generally can be classified into two groups, external factors (from the work environment) and internal factors (from the teacher him/herself). The external factors are the supervisor's leadership style, organization condition, the prosperity of employees, etc. While from the internal factors are motivation, self-confidence, academic competency, pedagogic competency, social competency, behavior competency, etc.

In another way, the performance can be improved not only by improving the professional competency but also it can be done by improving the motivation. The teacher will do the duty because there is something motivate inside of. Motivation is the desire to act and move toward a goal. Based on Hamzah (2010), motivation is an internal and external effort from someone to changes the behavior, which has indicators as follow: 1) a passion to do something, 2) effort and needs of something, 3) hopeful, 4) rewards and

honors, 5) good environment and 6) interest. According to the background above, so this study is about **the effects of professional competency and the work motivation to the work performances of a science teacher (survey of science teachers in junior high school)**. The survey itself was taken in the west Jakarta region and it has proposed only for national school.

▪ RESEARCH METHOD

Research design

This research was used as a survey method with a path analysis technique as the data analysis, as shown in the following scheme. The survey method is a technique of gathering data by asking questions to the correspondences to get the information needed, so some questions were prepared for each variable.

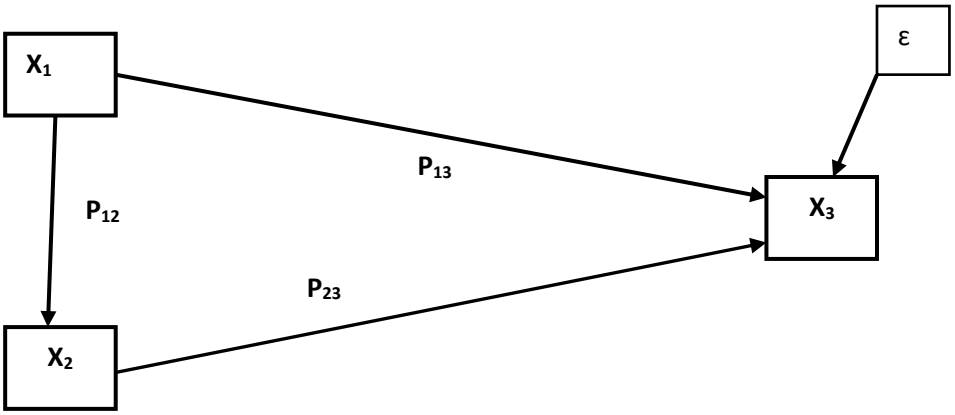

Figure 1. Scheme of research design

Where:
X_1 is the professional competency
X_2 is the work Motivation
X_3 is the work Performance
ε is another variable
P_{12} is the effect of professional competency to the work motivation
P_{13} is the effect of professional competency to the work performance
P_{23} is the effect of work motivation to the work performance

Participant

The population of this research is science teachers in National Junior High School, West Jakarta. Probability Sampling was used in this research is assuming every teacher has the same probability to be picked. According to the distribution of national junior high school in eight sub-districts in West Jakarta, Cluster Random Sampling was used specifically. There are 60 teachers were involved, which are 20 teachers for the validation of the instruments and 40 teachers as the research sample.

Instruments

The questionnaire as the instrument is used in this research. The list of multiple-choice questions related to the professional competency which is the knowledge or academic ability about science itself was prepared as the instrument for professional competency variable. The questionnaire with five options scale is used as the instruments for work performance and work motivation variables. The instrument for work performance variable is determined using four indicators: The planning, Implementation, and Evaluation with positive and negative values. The instrument for work motivation is determined using five indicators: Responsibility, Acknowledgement, Achievement, Self-development, and Independency with positive and negative values.

All the instruments have passed the validation and reliability test. For validation, all variable is determined using correlation formula, product-moment by Karl Pearson. While for the reliability, tests were used Alpha Cronbach's formula.

Validity and Reliability of Data Collection Tools

The validation test used in this research is internal validation which is the validity of the instrument is achievable if there is thorough conformation between the parts of the instrument. Using the product moments Karl Pearson, the values of validity (r_{xy}) were obtained, then compared to the value of r_{table} with the significance level 0f 5%. Were obtained 23 of 30 questions valid for work performance variable, 36 of40 questions valid for professional competency variable, and 27 of 30 questions valid for work motivation variable.

The reliability tests for the valid instruments give the result Alpha Cronbach's coefficient for work motivation is 0.953 means the instrument for this variable is very reliable. The Alpha Cronbach's coefficient for work performance is 0.947 means the instrument for work performance variable is very reliable and the last the Alpha Cronbach's coefficient for professional competency is 0.943 means the instrument for professional competency is very reliable.

Data Analysis Technique

From figure 2.1, X_1 is the independent variable (exogenous variable) for the endogenous variables X_2 and Y. X_1 is indirectly correlated to the Y, and indirectly correlation to the Y through X_2. To find the correlation between variables is used product-moments analysis by SPSS 22. The results from the analysis were used as the basic calculation to find the path coefficient. The path coefficient shows how 'strong' the effect of independent variables to the dependent variable if the number of the coefficient is below 0.05 so the path coefficient is categorized as 'weak' so the effect of the path can be dismissed. The path coefficient is the standard regression coefficient (Z) because the path correlation between variables is the combination of correlation so the calculation for path coefficient uses the standard of Z score. The value of the coefficient from each path (P_{21}, P_{31}, and P_{32}) can be found by calculating the coefficient of correlation.

The criteria of path analysis's significance test are:

1. If the path coefficient is greater than 0.05 so the path coefficient is significant. It means there is a significant effect between independent and dependent variables.

2. If the path coefficient is smaller than 0.05 so the path coefficient is not significant. It means there is no significant effect between independent and dependent variables and the path can be dismissed.

With the statistic hypothesis are:

1. H_0: $p_{31} = 0$, there is directly influence the professional competency to the work performed.
   H_1: $p_{31} \neq 0$, there is no direct influence on the professional competency to the work performed.
2. H_0: $p_{32} = 0$, there is directly influence the work motivation to the work performed.
   H_0: $p_{32} \neq 0$, there is directly influence the work motivation to the work performed.
3. H_0: $p_{21} = 0$, there is directly influence the professional competency to the work motivation.
   H_0: $p_{21} \neq 0$, there is directly influence the professional competency to the work motivation.
4. H_0: $p_{321} = 0$, there is indirectly non-significant influence the professional competency to the work performance through the work motivation.
   H_0: $p_{321} \neq 0$, there is indirectly significant influence the professional competency to the work performance through the work motivation.

The criteria of the path analysis test are :

1. H_1 will be accepted if the value of $t_{calculation} > t_{table}$
2. H_0 will be accepted if the value of $t_{calculation} < t_{table}$

▪ RESULT AND DISCUSSION

Research data descriptions

There are 23 questions with the maximum score is five for each question to determine the work performance score. The average score for work performance is 105.98; it means the score is very high for the work performance of the respondents. The value of the standard deviation is 6.17%, it means only a few differences of answer between each respondent.

The maximum score for professional competency is 36, the average score was obtained 32, shows that the academic ability of respondents is very good and the standard deviation is 2.19% shows that there is no big difference in answer between the respondents. The median is 32 that shows most of the respondent has professional competency above the average. The other result for work motivation score, with the maximum score, is 135 for 27 questions, the average score is 102.5 shows that the work motivation of the respondents is very good but the value of standard deviation is 12.81% shows there are too many differences in answer from the respondents. The following figures show that the data of all variables are normally distributed.

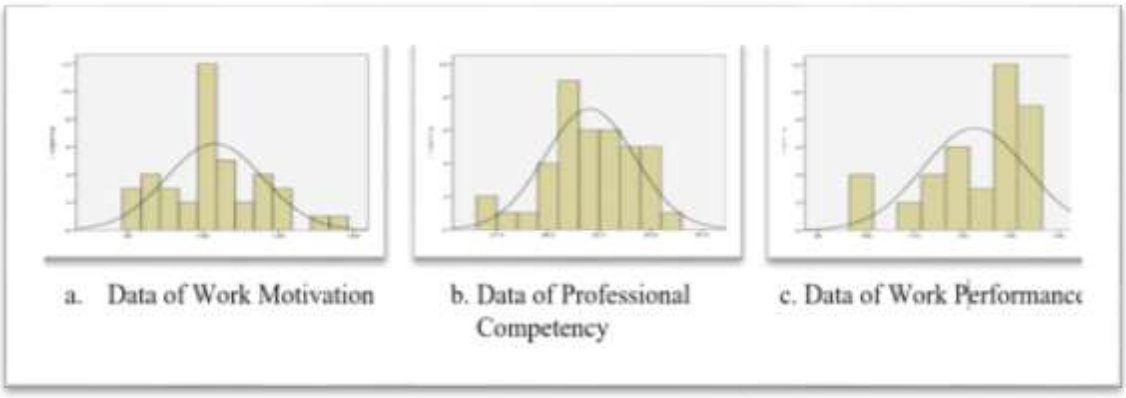

Figure 2. The histogram of data all variable

A. Research data analysis prerequisite test

Kolmogorov-Smirnov p-value test is used in this research to prove that all data is distributed normally. Based on table 1 below, shows that all the data has a p-value is greater than 0.05. The p-value of work performance is 0.094, the p-value for professional competency is 0.152 and the p=value for work motivation is 0.200 which means all data is distributed normally.

Table 1. Normality test

One-Sample Kolmogorov-Smirnov Test

		Work Performance	Professional Competency	Work Motivation
N		40	40	40
Normal Parameters[a,b]	Mean	105,98	32,03	103,03
	Std. Deviation	6,175	2,190	12,813
Most Extreme Differences	Absolute	,129	,120	,101
	Positive	,075	,106	,101
	Negative	-,129	-,120	-,077
Test Statistic		,129	,120	,101
Asymp. Sig. (2-tailed)		,094[c]	,152[c]	,200[c,d]

Linearity tests were done to prove that there is a linear correlation between variables. The hypothesis used are $H_0 = \hat{Y} = a + BX$ (linear regression) and $H_1 = \hat{Y} \neq a + BX$ (nonlinear regression). Here are the results of each variable:

a. Linearity test results for professional competency to the work motivation of science teachers.
   As shown in table 2, the value of F on the deviation from linearity is 2.103 with the sig. value 0.067 is greater than 0.05 means that the regression model is linear.

Table 2. Linearity test for professional competency to the work motivation of science teacher.

ANOVA Table

			Sum of Squares	df	Mean Square	F	Sig.
Motivasi * Kompetensi_profesional	Between Groups	(Combined)	3627.203	9	403.023	3.362	.006
		Linearity	1610.665	1	1610.665	13.438	.001
		Deviation from Linearity	2016.538	8	252.067	2.103	.067
	Within Groups		3595.772	30	119.859		
	Total		7222.975	39			

b. Linearity test result for professional competency to the work performance of science teachers.
As shown in table 3, the value of F on the deviation from linearity is 0.973 with the sig. value 0.476 is greater than 0.05 means that the regression model is linear.

Table 3. Linearity test for professional competency to the work performance of science teachers.

ANOVA Table

			Sum of Squares	df	Mean Square	F	Sig.
Kinerja * Kompetensi_profesional	Between Groups	(Combined)	1576.711	9	175.190	1.762	.118
		Linearity	802.875	1	802.875	8.074	.008
		Deviation from Linearity	773.836	8	96.730	.973	.476
	Within Groups		2983.189	30	99.440		
	Total		4559.900	39			

c. Linearity test results for work motivation to the work performance of science teachers.
As shown in the table 4, the value of F on the deviation from linearity is 1.572 with the sig. value 0.174 is greater than 0.05 means that the regression model is linear.

Table 4. Linearity test for work motivation to the work performance of science teachers.

ANOVA Table

			Sum of Squares	df	Mean Square	F	Sig.
Kinerja * Motivasi	Between Groups	(Combined)	3573.150	22	162.416	2.798	.017
		Linearity	1656.523	1	1656.523	28.539	.000
		Deviation from Linearity	1916.627	21	91.268	1.572	.174
	Within Groups		986.750	17	58.044		
	Total		4559.900	39			

Multi Co-linearity test was done to detect if there any co-linearity by checking the value of Variance of Inflation Factor (VIF) with the hypothesis are H_0 = there is co-linearity between independent variables; H_1= there is no collinearity between independent variables. A regression model is free from the co-linearity if it has the value of VIF approximately 1 and the Tolerance's value closes to 1. Based on the test result shown on table 5, there is no co-linearity between professional competency and work motivation variables.

Table 5. The test result of multi co-linearity

Collinearity Statistics	
Tolerance	VIF
.840	1.190
.840	1.190

B. Hypothesis testing

Path analysis is used to describe the relationship between variables. There are three steps must be completed, 1). Correlation analysis, 2). Determining the path coefficient, and 3). Testing the path coefficient. Based on the test, the coefficients of correlation are shown on table 6.

Table 6. Coefficient of correlation

Relation between variables	Correlation	Value
The Professional competency to the work performance	r_{13}	0.436
The work motivation to the work performance	r_{23}	0.508
The Professional competency to the work motivation	r_{12}	0.387

The result from the coefficient of correlation, the next step is to to determine the path coefficient, the result is shown on figure 3.

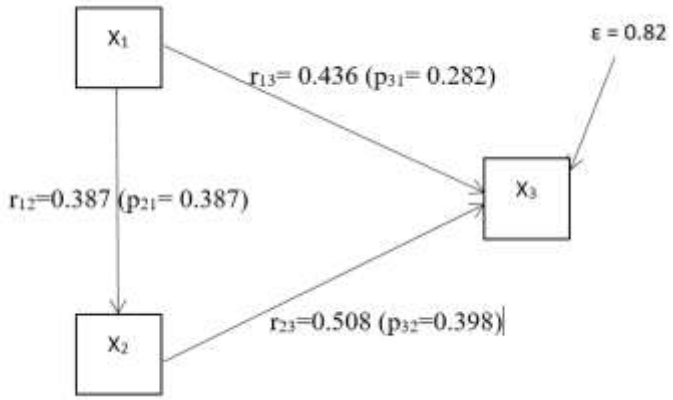

Figure 3. The path coefficient

All value of the path coefficient is significant (greater than 0.05). It means that all hypothesis are accepted and prove that there are direct effect X_1 (professional competency) to X_3 (work performance); and indirect effect X_1 (professional competency) to X_3 (work performance) through X_2(work motivation), there is direct effect X_1 (professional competency) to X_2 (work motivation), there is direct effect X_2 (work motivation) to X_3 (work performance). The data table of the path coefficients is shown on table 7.

Table 7. Summary of path coefficient

Variable	Effect		
	Direct	Indirect	Total
X_1 to X_2	0.387	-	0.387
X_1 to X_3	0.282	= 0.387 x 0.398 = 0.154	0.436
X_2 to X_3	0.398	-	0.398
ε	0.82		0.82

Interpretation of the results

1. **The direct effect of professional competency (X_1) to the work performance of science teacher (X_3)**

According to (Harry Susanto, 2012): the effect category for each independent variable to the dependent variable as shown on table 8.

Table 8. The effect category of variables

Path coefficient	Effect
0.05 – 0.09	Weak
0.10 – 0.29	Medium
> 0.3	Strong

Based on the calculation result shows that there is a correlation between professional competency and the work performance science teacher with the correlation coefficient 0.436 and the direct effect is strong and significant (value of p_{31} = 0.282= 28.2%). The rest of the 71.8% is affected by other external factors.

The quality of work performance of the teacher is stated in the regulation of education minister of Indonesia No. 16 2007 about the academic qualification standard and teacher competency. It explained that the competency of the teacher's standard was developed as a whole and complete from the four main competencies: pedagogic competency, social competency, professional competency, and personality competency. All of it is integrated into the work performed.

Professional competency is the ability of teachers in the process of learning that relate to mastering the material or knowledge of the subject in charge. Rusman (2013:58) explained there are some criteria for professional competence:

a. Mastering the material, structure, concept and the mindset of knowledge which supporting the subject.
b. Mastering the standard of competence and basic competency of the subject.
c. Develop the subject's material creatively.
d. Develop progressive professionalism by reflective actions.
e. Take advantage of information technology and communication to self-improvement.

Based on the result of the calculation shows that the result of the research is fixed with the hypothesis of research, which states that there are direct effects of professional competency on the work performance of science teachers.

A teacher that has mastered the materials, concepts and mindset of the knowledge will give a positive contribution to the work performance of the teacher. Wibowo (2014:272) stated that the great executor is the one that shows higher competence's performance, frequently and better than the ordinary or average executor. The same result showed in some researches, Mardia Rahman (2014) in the *Journal of Education and Practice* stated: "professional competency gives a positive effect to the work performance of science teachers in Ternate". Even though in the different subjects was researched by Rahmawati Mega Ayu (2011) stated: "professional competency gives a positive effect to the work performance of economics teachers in Tegal". As a result, the way to improve the work performance can be done by improving the professional competence of the teacher.

2. The direct effect of work motivation (X_2) to the work performance of science teacher (X_3)

The result shows that there is a significant correlation between the work motivation and the work performance by the coefficient 0.508, and strong direct effect and significant (value of p_{32} = 0.398 = 39.8%). The rest was determined by the other external factors.

Based on the calculation result, the result of the research is in according with the hypothesis that stated there is a direct effect of work motivation on the work performance of science teachers. Wibowo (2014:322) stated that motivation is the process of intensity, direction, and effort as continuously of the individual to reach the target. A teacher that has high motivation will always give the best to self-improving, creative thinking, and continuously try to reach the target. As the increase in motivation, will surely the performance also increases. The motivation gives effect to the work performance, even if it is not the only factor causing it because there are so many external factors affect it.

The research of Dian Handayani (2010:102) stated that there is a significant effect of work motivation on the work performance of the teacher. As a result, improvement in the work performance can be done by improving work motivation.

3. The direct effect of professional competency (X_1) to the work motivation of science teacher (X_2)

The result shows that there is a significant correlation between the professional competency to the work motivation with the coefficient 0.387, and the strong direct effect and significant (the value of p_{21} = 0.387 = 38.7%). The rest 61.3% was affected by other external factors.

Based on the calculation result, this research gives result in accordance with the hypothesis suggested. The motivated action id affected by the skills or knowledge of an individual in the context of work. A teacher must have professional competence in order can reach the target, under the high motivation also gives the best effort to improve professional competence. Cave and Mulloy (2010:12): "*There is evidence that highly motivated teachers are more likely to engage in PD and implement innovative programs to increase student learning"*. As a result improving professional competence will surely increase the work motivation, and vice versa.

4. The indirect effect of professional competence (X_1) to the work performance of science teacher (X_3) through the work motivation (X_2)

The result of the research shows that there is a significant indirect effect between professional competence to the work performance through the work motivation with the coefficient p_{321} = 0.154 = 15.44% which is a smaller value than the direct effect of professional competence to the work performance (28.2%). The calculation result shows that the research's result is the same with the hypothesis, which stated that there is a significant indirect effect between professional competencies the work performance through work motivation. A teacher that has professional competence will be motivated to do the job desk because of the satisfaction and comfort to deliver the knowledge that has been mastered. In accordance with it, work performance will increase significantly. The work performed will be reached as the target if there is high motivation, the ability of self-motivating and motivate the students are the part of the professional competence of a teacher. Javid (2010:49) stated that job performance is the product of a combination of individual motivation and ability.

▪ CONCLUSION

According to the result of the result, can be concluded that work performance can be affected significantly both by motivation and by professional competency directly and significantly by indirect effect professional competency through motivation. This research result can be used as a reference, especially for the school management board to improve the quality of teacher's work performance by increasing their professional competency and work motivation.

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