

THE INFLUENCE OF TEACHER PROFESSIONAL COMPETENCE AND INTERPERSONAL INTELLIGENCE TOWARDS MOTIVATION AND PHYSICS LEARNING RESULT OF STUDENT AT XI MIA GRADE SMA NEGERI 1 PANGKAJENE

Murniaty M¹, Kaharuddin Arafah², Subaer³

¹Student at Phisycs Education Post Graduate Program, State University of Makassar

²Lecturer at Phisycs Education Post Graduate Program, State University of Makassar
murni.mursalin@yahoo.com

Abstract - This research is ex-post-facto research which aims to determine the influence of: (1) the teacher professional competence towards physics learning result; (2) interpersonal intelligence towards physics learning result; (3) the teacher professional competence towards learning motivation; (4) interpersonal intelligence towards learning motivation; and (5) learning motivation towards physics learning result. The populations in this study were all students of XI MIA Grade SMA Negeri 1 Pangkajene as many as 173 students. The sample taken by using Slovin technique with 122 students. The process of collecting data using questionnaires and test of physics learning result that have been tested empirically. Data of the research result were analyzed by using analysis method of *Structural Equation Modeling* (SEM) with technique of *Analysis of Moment Structures* (AMOS). The analysis procedure is performed with descriptive analysis and inferential analysis, factor analysis and verification of structural model AMOS. The result of research showed that the structural equation model that describes the influence of teacher professional competence, interpersonal intelligence, learning motivation, and physics learning result can be accepted. Through the model can be concluded that: (1) the teacher competence professional doesn't have positive direct influence and significant toward physics learning result; (2) interpersonal intelligence doesn't have positive direct influence and significant towards physics learning result; (3) the teacher professional competence has positive direct influence and significant towards learning motivation; (4) interpersonal intelligence has positive direct influence and significant towards learning motivation; and (5) learning motivation has positive direct influence and significant towards physics learning result.

Keywords: *ex-post-facto, teacher competence professional, interpersonal intelligence, learning motivation, physics learning result*

I. INTRODUCTION

The progress of a nation is determined by the quality of human resources, and quality of human resources depends on the quality of education. Education is one of the main pillars of building a nation towards modern civilization, and handles a very important and strategic for human life, because human beings through education will be equipped with a range of capabilities to meet the challenges and changes through a learning process.

In this case the teacher is the most decisive component in the education system as a whole that should be a major concern. The teachers handle a major role in the development of education, particularly organized formally in school. The teacher is a component that most influence on the creation process and the quality of educational outcomes. Reference [1] states that the learning process and learning outcomes of students is not only determined by the school, patterns, structures, and the curriculum, but is largely determined by the competence of

teachers who teach and guide students. Competence of teachers is one of the factors that affect the achievement of learning objectives and education in schools. One of teacher competence will be examined in this study, namely professional competence. Professional teachers are teachers who have the ability and expertise in the field of teacher training so that they can perform their duties and functions to provide knowledge and character to the students to the maximum.

Keep in mind other than IQ that developed at this time, there are many types of intelligence that go with it, such as intelligence concept coined by Howard Gardner. Of the many intelligence delivered by Gardner (2003) in the theory of Multiple Intelligence, he suggests the importance of interpersonal intelligence. Interpersonal intelligence is the intelligence that involves the skills to work with others and communicate with both verbal and non-verbal [2]. In addition to high Intelligence Quotient, interpersonal intelligence is also required in the process of learning physics are not just studying the concept and doing experiments. Not quite up there, not all of the material in physics can be solved by the individual personally, sometimes students need a teacher or a friend to explain associated with such materials. By understanding the interpersonal intelligence will assist students in the process of studying physics.

The success of students in developing interpersonal intelligence is also influenced by the presence of psychological factors that exist in self-students. Psychological factors will lead to the desire, drive and passion for learning, or move the students to study harder. The psychological factors include the motivation to learn, motivation to learn also give good directions to the learning activities undertaken by students, so that the desired learning result can be achieved.

Thus the rationale encourage researchers to conduct research on the influence of teachers' professional competence and interpersonal intelligence towards motivation and physics learning result of students at XI MIA Grade SMA Negeri 1 Pangkajene. The problems in this research are: (1) Does the teacher professional competence have positive direct influence towards physics learning result? (2) Does interpersonal intelligence have positive direct influence towards physics learning result? (3) Does the teacher professional competence have positive direct influence towards learning motivation? (4) Does interpersonal intelligence have positive direct influence towards learning motivation? (5) Does the learning motivation have positive direct influence towards physics learning result? The purpose of this study was to answer the formulation of the problem, namely (1) to determine the direct influence of teacher professional competence towards physics learning result, (2) to determine the direct influence of interpersonal intelligence towards physics learning result, (3) to determine the direct influence of teacher professional competence towards learning motivation, (4) to determine the direct influence of interpersonal intelligence towards learning motivation, and (5) to determine the direct influence of learning motivation towards physics learning result. The results of this study are expected to provide good benefits for students, teachers, schools and other researchers. For students, this study can provide input to further improve learning result. For teachers, this research as information can provide a positive discourse. For schools, this research can be used as information material in improving the teaching competence of teachers. As for other researchers, this study can be used as reference for further research, especially research that focuses on internal factors on students to subjects Physics.

II. RESEARCH METHOD

The type of research is the study "ex post facto", which is causality and correlation. This study attempted to investigate the direct influence of the independent variables namely the teacher professional competence and interpersonal intelligence on physics learning result as dependent variables, both directly and through the learning motivation as an intervening variable. Designs of linkages between these variables are described as follows.

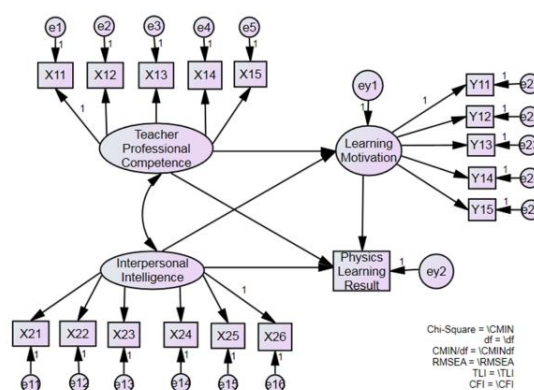


Figure 1. Structural Model of Functional Interwoven Proposed Among Variables Research

The populations in this study were all students of class XI MIA SMA Negeri 1 Pangkajene academic year 2015/2016, Pangkep Regency, and South Sulawesi. Distribution of students in each class is shown in table 1 below.

Table 1. Distribution Of Student Class XI MIA

Name of Class	Number of Students
XI MIA 1	33
XI MIA 2	35
XI MIA 3	35
XI MIA 4	35
XI MIA 5	35
Total	173

The technique used to determine the sample size is by slovin technique. As for the distribution of the sample is more presented in table 2 below.

Table 2. Distribution of Research Sample

Name of Class	Number of Students	Sample
XI MIA 1	33	-
XI MIA 2	35	32
XI MIA 3	35	33
XI MIA 4	35	28
XI MIA 5	35	29
Total	173	122

The instrument used in this study consisted of questionnaire of the teacher professional competence, interpersonal intelligence questionnaire, questionnaire learning motivation, and test of physics learning result.

Before the instrument is ready for use, it must first be validated instrument that is validation of content and empirical validity. Contents validation test conducted on measuring instruments. Analysis of the contents of the instrument validation is done in this research that uses models Gregory in the form of a model agreement among experts. Empirical validation test performed on the test results the instrument consisting of item validity test and reliability test. Types and data collection techniques used in this study can be seen in the following table.

Table 3. Types and Data Collection Techniques

Data	Type of Data	Data Collection Techniques	Data Sources	Instrument
Teacher Professional Competence	Interval	Questionnaire	Students	Questionnaire of Teacher Professional Competence
Interpersonal Intelligence	Interval	Questionnaire	Students	Questionnaire of Interpersonal Intelligence
Learning Motivation	Interval	Questionnaire	Students	Questionnaire of Learning Motivation
Physics Learning Result	Interval	Questionnaire	Students	Questionnaire of Physics Learning Result

Analysis of the data used in this study consisted of a statistical analysis of descriptive and inferential analysis to test the hypothesis.

A. Analysis of Descriptive Statistic

A function of descriptive analysis is to provide an overview of the data obtained, such as: the number, maximum, minimum, mean, mode, median, standard deviation and variance.

B. Normality Test

Normality test is used to determine whether the data sample studied came from populations with normal distribution or not. Values were considered in determining test multivariate normality is critical ratio by using AMOS 22.0.

C. Linearity Test

Linearity test is performed to determine whether there is a linear relationship between the independent variables with the dependent variable using SPSS 22.0. The variable is said to be linear with other variables when sig.Linearity > 0.05.

D. Multicollinearity Test

Multicollinearity test is performed to determine whether there is a significant relationship between independent variables in a multiple linear regression model. Multicollinearity test was performed using statistical program SPSS 22.0 to see the value of Tolerance and Variance Inflation Factor (VIF) in the regression model.

E. Factor Analysis

Factor analysis was performed using AMOS 22.0 to be able to test the influence of the indicator with latent variables, a model must be eligible Goodness of Fit, which is an index that is used as a reference model is said to be acceptable fit. The index used is the Chi-square, CMIN / df, TLI, CFI and RMSEA.

III. RESULT AND DISCUSSION

A. Analysis Result of Research Data

1. Descriptive Statistic

Table 4. Summary of Descriptive Analysis Result

Statistic	Teacher Professional Competence	Interpersonal Intelligence	Learning Motivation	Physics Learning Result
Number of respondent	122	122	122	122
Number of item	30	32	30	29
Mean	112.50	121.22	110.95	15.69
Std. Error of Mean	.985	1.098	1.399	.490
Median	113.00	121.00	111.00	16.00
Mode	111.00 ^a	128.00	105.00 ^a	9.00 ^a
Deviation Standard	10.88	12.13	15.46	5.41
Variance	118.417	147.154	239.022	29.337
Skewness	-.765	-.268	-.333	-.116
Kurtosis	2.348	.240	.127	-.987
Range	70.00	67.00	81.00	22.00
Minimum	64.00	84.00	63.00	4.00
Maximum	134.00	151.00	144.00	26.00

a. Multiple modes exist. The smallest value is shown

Research result data of variable the teacher professional competence then presented the list of frequency distribution as shown in table 5 below.

Table 5. Distribution of Frequency, Percentage, and Categories for Teacher Professional Competence

Interval Score	Category	Frequency	Percentage (%)
30.00 – 54.40	Very Low	0	0
54.50 – 78.40	Low	1	0.82
78.50 – 102.40	Moderate	17	13.93
102.50 – 126.40	High	93	76.23
126.50 – 150.00	Very High	11	9.02
Total		122	100

Research result data of variable the interpersonal intelligence then presented the list of frequency distribution as shown in table 6 below.

Table 6. Distribution of Frequency, Percentage, and Categories for Interpersonal Intelligence

Interval Score	Category	Frequency	Percentage (%)
32.00 – 58.00	Very Low	0	0
58.10 – 83.60	Low	0	0
83.70 – 109.20	Moderate	20	16.40
109.30 – 134.80	High	86	70.49
134.90 – 160.00	Very High	16	13.11
Total		122	100

Research result data of variable the learning motivation then presented the list of frequency distribution as shown in table 7 below.

Table 7. Distribution of Frequency, Percentage, and Categories for Learning Motivation

Interval Score	Category	Frequency	Percentage (%)
30.00 – 54.40	Very Low	0	0
54.50 – 78.40	Low	3	2.46
78.50 – 102.40	Moderate	30	24.60
102.50 – 126.40	High	73	59.83
126.50 – 150.00	Very High	16	13.11
Total		122	100

Research result data of variable physics learning result then presented the list of frequency distribution as shown in table 8 below.

Table 8. Distribution of Frequency, Percentage, and Categories for Learning Motivation

Interval Score	Category	Frequency	Percentage (%)
0.00 – 6.20	Very Low	2	1.64
6.30 – 12.00	Low	33	27.05
12.10 – 17.80	Moderate	38	31.14
17.90 – 23.60	High	41	33.61
23.70 – 29.00	Very High	8	6.56
Total		122	100

2. Analysis Prerequisites Test

a. Data Normality Test

By using a significance level of 0.01, the data is said to be normally distributed if the critical ratio (cr) of kurtosis is between ± 2.58 . Based on the results of the output data normality test on Assessment of normality, normality test results obtained by the value of the multivariate cr kurtosis $3.497 > 2.58$ which means multivariate distribution is not normal.

To make the normal distribution of data, then the next step is the possibility of detecting the data included in the category of outlier by looking at the table Mahalanobis Distance. Thus, most data outliers and should be excluded from the data analysis is the number of respondents are 53 and 43.

After removing outlier values obtained cr multivariate kurtosis 1.889. It shows the data is normally distributed, either individually or multivariate and deserves to be analyzed further.

b. Linearity Test

Based on the results of linearity test the influences of X_1 with Y_2 have sig Linearity 0.000. For the influence of X_2 with Y_2 have sig Linearity 0.000. As for the influence of Y_1 with Y_2 have a sig Linearity 0.000. This means that the value of sig Linearity less than 0.05 ($0.000 < 0.05$). So it can be concluded that the influence of variable professional competence of teachers with physics learning result, the influence interpersonal intelligence with physics learning result and learning motivation with physics learning result are linear and are eligible for further analysis.

c. Multicollinearity Test

Table 9. The Result Of Multicollinearity Test

Model	Collinearity Statistics	
	Tolerance	VIF
Teacher Professional Competence (X_1)	0.777	1.287
Interpersonal Intelligence (X_2)	0.603	1.659
Learning Motivation (Y_1)	0.551	1.816

Dependent Variable: Physics Learning Result (Y_2)

3. Factor Analysis

a. Factor Analysis of Latent Variables

Test the fit between the theoretical models to empirical data can be seen at the level of Goodness of Fit Statistics.

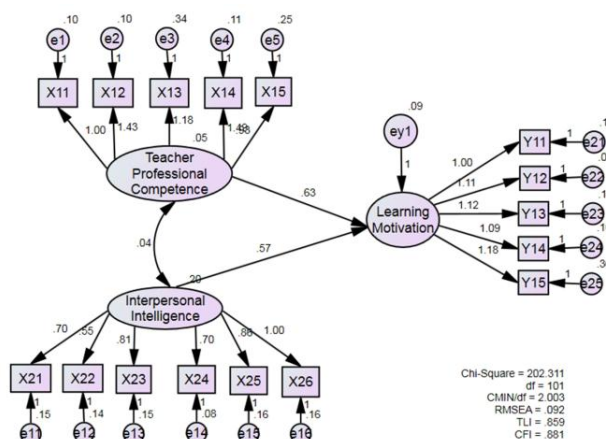


Figure 2. Initial Factor Model of Latent Variables

The result of the factor analysis beginning shows that there are indices that do not meet the cut off value. Modifications made some errors influence of variables that have a value large change Chi-square. The modification result then re-analyzed by the results in Figure3.

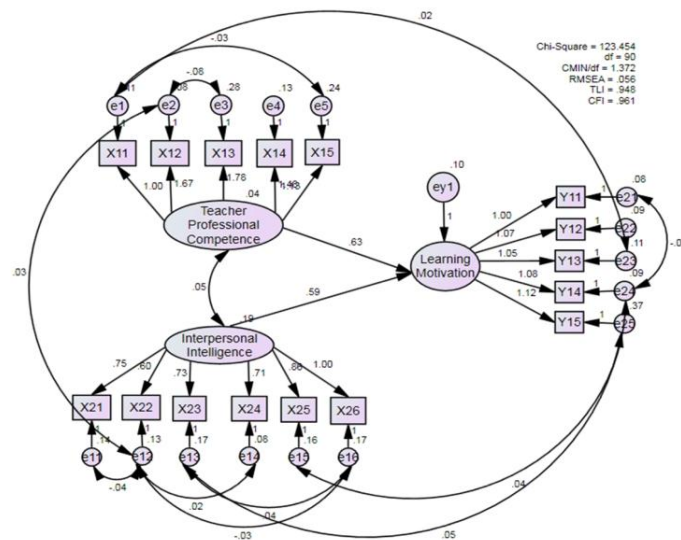


Figure 3. Final Factor Model of Latent Variables

The final result can be seen that all the indexes have met the criteria so that these models can be received and analyzed further. Standardized regression weights can also show the influence of latent variables with the indicators.

Table 10. Standardized Regression Weights Of Latent Variables

		Estimate
X ₁₁	<--- Teacher Professional Competence	0.853
X ₁₂	<--- Teacher Professional Competence	0.858
X ₁₃	<--- Teacher Professional Competence	0.834
X ₁₄	<--- Teacher Professional Competence	0.859
X ₁₅	<--- Teacher Professional Competence	0.655
X ₂₆	<--- Interpersonal Intelligence	0.733
X ₂₅	<--- Interpersonal Intelligence	0.688
X ₂₄	<--- Interpersonal Intelligence	0.735
X ₂₃	<--- Interpersonal Intelligence	0.616
X ₂₂	<--- Interpersonal Intelligence	0.586
X ₂₁	<--- Interpersonal Intelligence	0.658
Y ₁₁	<--- Learning Motivation	0.522
Y ₁₂	<--- Learning Motivation	0.764
Y ₁₃	<--- Learning Motivation	0.566
Y ₁₄	<--- Learning Motivation	0.639
Y ₁₅	<--- Learning Motivation	0.428

1) Model Verification and Final Model Development

Verified the theoretical model developed based on empirical data. An analysis of the Figure 3 is the structural equation model of initial stages.

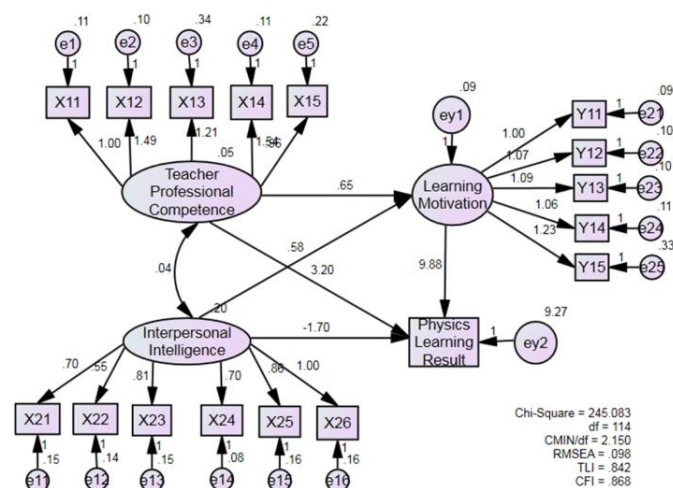


Figure 4. Structural Equation Model of Initial Stages

The results of the analysis of the initial stages in figure 4 shows that there are indices that do not meet the cut off value. Modifications made some errors influence of variables that have a value large change Chi-square. The modification result then re-analyzed by the results in Figure 5.

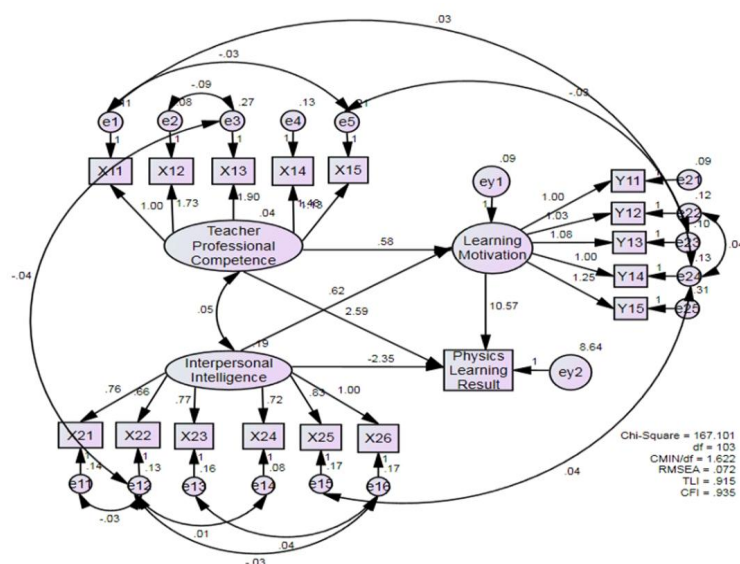


Figure 5. Structural Equation Model of Final Stages

In the final result can be seen that all the indexes have met the criteria so that these models can be received and analyzed further. Parameter of regression weighted shown in the table 10 below.

Table 11. Regression Weight of Final Model

		Estimate	S.E.	C.R.	P
Y ₁	<--- X ₁	0.578	0.241	2.401	0.016
Y ₁	<--- X ₂	0.621	0.125	4.947	0.000
Y ₂	<--- Y ₁	10.565	1.394	7.579	0.000
Y ₂	<--- X ₂	-2.341	1.354	-1.729	0.084
Y ₂	<--- X ₁	2.608	2.264	1.152	0.249

Structural model is obtained based on the index overall fit can be seen in table 10. Mathematically structural equation model can be written:

$$\hat{Y} = 15.683 + 2.608X_1 - 2.341X_2 + 10.565Y_1 \quad R^2 = 70\%$$

B. Discussion

1. The Direct Influence of Teacher Professional Competence towards Physics Learning Result.

For the first hypothesis testing showed that the influence variables of teacher professional competence towards physics learning result described in the regression weights of final model with the estimate results $\gamma_{x_1y_2} = 2.608$ with p value = 0.249 > 0.05. This means that H_0 accepted and H_1 rejected at the significance level 0.05. This result indicates that the teacher professional competence does not have positive direct influence and significant towards physics learning result.

2. The Direct Influence of Interpersonal Intelligence towards Physics Learning Result

For the second hypothesis testing showed that the influence variables of interpersonal intelligence towards physics learning result described in the regression weights of final model with the estimate results $\gamma_{x_2y_2} = -2.341$ with p value = 0.084 > 0.05. This means that H_0 accepted and H_1 rejected at the significance level 0.05. This result indicates that interpersonal intelligence does not have positive direct influence and significant towards physics learning result.

3. The Direct Influence of Teacher Professional Competence towards Learning Motivation

For the third hypothesis testing showed that the influence variables of teacher professional competence towards learning motivation described in the regression weights of final model with the estimate results $\gamma_{x_1y_1} = 0.578$ with p value = 0.016 < 0.05. This means that H_0 rejected and H_1 accepted at the significance level 0.05. This result indicates that teacher professional competence has positive direct influence and significant towards learning motivation.

4. The Direct Influence of Interpersonal Intelligence towards Learning Motivation

For the fourth hypothesis testing showed that the influence variables of interpersonal intelligence towards learning motivation described in the regression weights of final model with the estimate results $\gamma_{x_2y_1} = 0.621$ with p value = 0.000 < 0.05. This means that H_0 rejected and H_1 accepted at the significance level 0.05. This result indicates that interpersonal intelligence has positive direct influence and significant towards learning motivation.

5. The Direct Influence of Learning Motivation towards Physics Learning Result

For the fifth hypothesis testing showed that the influence variables of learning motivation towards physics learning result described in the regression weights of final model with the estimate results $\beta_{y_1y_2} = 10.566$ with p value = 0.000 < 0.05. This means that H_0 rejected and H_1 accepted at the significance level 0.05. This result indicates that learning motivation has positive direct influence and significant towards physics learning result.

IV. CONCLUSION AND SUGGESTION

The results showed that: 1) the teacher professional competence does not have positive direct influence and significant towards physics learning result; 2) interpersonal intelligence does not have positive direct influence and significant towards physics learning result; 3) the teacher professional competence has positive direct and significant towards learning motivation; 4) interpersonal intelligence has positive direct influence and significant towards learning motivation, and 5) the learning motivation has positive direct influence and significant towards physics learning result.

Based on the research results obtained, it is advisable that matters; 1) For teachers to better understand the psychological factors that can affect the results of students; 2) for students to further develop the factors that was in him to get the optimal learning results; 3) For researchers interested in developing further this research, is expected to examine the limitations in this study, so further research can enhance this research.

REFERENCES

- [1] Hamalik, Oemar. 2004. *Pendidikan Guru Berdasarkan Pendekatan Kompetensi*. Jakarta: Bumi Aksara.
- [2] Alder, Harry. 2001. *Boost Your Intelligence: Pacu EQ dan IQ Anda*, Terj. Christina Priandingsih. Jakarta: Erlangga