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## **Revisiting pedagogical skills: A comprehensive analysis of Mathematics teaching competencies among elementary educators**

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### **ABSTRACT**

This research aims to explore the intricate relationships between attitudes towards the teaching profession, teaching experience, self-concept, and teaching competencies among elementary school teachers. The study's sample comprises 40 first-grade teachers from elementary schools in Yogyakarta, selected through a multistage cluster random sampling technique. The findings of this research indicate several key correlations: (1) a positive correlation exists between attitudes towards the teaching profession and teaching competencies; (2) teaching experience positively correlates with teaching competencies; (3) self-concept also shows a positive correlation with teaching competencies. Moreover, the study reveals that attitudes towards the teaching profession, teaching experience, and self-concept collectively contribute to a significant positive correlation with teaching competencies. These results highlight the multifaceted nature of teaching proficiency and underscore the importance of fostering positive attitudes, accumulating teaching experience, and developing a strong self-concept to enhance educational outcomes in elementary education.

**Keywords:** Teaching Competencies, Teacher Proficiency, Teacher Attitudes

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## **INTRODUCTION**

Over the past five years, the development of education in general and primary education in particular has shown progress, both quantitatively and qualitatively. The overall improvement in the quality of the education system requires systemic efforts in terms of the preparation, guidance, and competency development of a large number of teachers, school principals, and supervisors to ensure the implementation of high-quality educational programs in schools. This will enable them to effectively fulfill their roles in delivering and developing relevant and responsive teaching processes that meet the changing needs of individuals and society.

Improving and equalizing the quality of primary education is a major concern of the government because primary education serves as a crucial foundation for the subsequent levels of schooling. The quality and presence of primary education are essential considerations as part of the human resource development strategy.

In correspond to enhance human resources, education holds a highly strategic position. The quality and quantity of available education will determine the availability of human resources. Quality human resources can only emerge from quality education. The government consistently strives to improve the quality of education through various renewal programs. The development of mathematics and student-centered teaching approaches at all levels of education is a tangible example of renewal efforts aimed at improving the quality of education.

At present, it cannot be denied that advancements in science and technology are continuously progressing. One factor that has not carefully been considered is the rapid pace of life changes compared to the education provided. According to Engkoswara (2019: 30-31), this

situation would be better if the current approach is perfected by emphasizing education as the primary force for long-term future development in the dimensions of life. This requires a lot of innovation in the field of educational technology. The concern for educational technology in the teaching process, as stated by Miarso (2019: 3), is its ability to perform the functions of education development, including design, evaluation, selection, utilization, dissemination, and the functions of educational management, including organizational and personnel management, to the fullest extent possible.

This issue has prompted the government through the Ministry of National Education to strive to improve the quality of education, starting from the primary level. These efforts simultaneously address the demands of the community, which tend not only to seek quality education but also demand it. The quality improvement of education in elementary schools can be achieved through various efforts. These efforts include enhancing the quality and professionalism of teachers through continuous education and training to meet the teacher competency standards.

The quality of teaching and learning activities in elementary schools is determined by the teaching ability of teachers. As educators, teachers must continuously pay attention to the basic aspects of teaching and learning activities. Teaching and learning activities should be interactive and have pedagogical aspects. Therefore, the issue of teachers' teaching ability needs attention.

Teachers have a crucial role in teaching and learning activities in elementary schools. Experienced teachers or those who have been teaching for a long time have accumulated a wealth of knowledge through their experiences in both planning and implementing instruction. As a result, with extensive teaching experience, they tend to have high teaching abilities.

Teachers' ability to teach mathematics undoubtedly has an impact on the quality of mathematics teaching and learning activities. This aligns with the opinion of James and Dahl (2020: ix) that a teacher's mastery of the subject matter greatly influences the quality of teaching. Issues related to the teacher component in teaching mathematics, when thoroughly analyzed, are closely related to the functions of management and the development of instruction in improving the quality and role of teachers in making teaching and learning activities effective. Additionally, they can contribute to strategic thinking in anticipating mathematics teaching activities in elementary schools in relation to the curriculum, institutional structure, and educational management.

### **Problem Formulation**

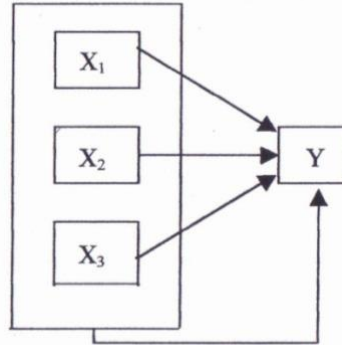
The current study aims to address a crucial issue in the field of teachers' ability in teaching mathematics, particularly in elementary school level. Therefore, the research questions can be formulated as follows: Is there a relationship between attitudes towards the teaching profession and the mathematics teaching ability of elementary school teachers?, Is there a relationship between teaching experience and the mathematics teaching ability of elementary school teachers?, Is there a relationship between self-concept and the mathematics teaching ability of elementary school teachers?, Is there a relationship between attitudes towards the teaching profession, teaching experience, and self-concept with the mathematics teaching ability of elementary school teachers?

## **METHOD**

### **Types, Subjects, Collection Techniques, and Research Instruments**

This research aims to determine the relationship between the attitude towards the teaching profession, teaching experience, self-concept, and the teaching ability of elementary school mathematics teachers, both individually and collectively. The method used was a survey with a correlational technique. The constellation of the problem can be described as follows in Figure 1. The study was conducted in elementary schools in Kota Yogyakarta. The sampling was done using a multistage cluster random sampling technique, selecting 7 out of 14 districts as the research locations. From these 7 districts, 40 elementary schools were randomly selected, resulting in a total sample size of 40 respondents, who were the teachers teaching in grade I.

There were also four different instruments used in this study. The instruments for the variables of teaching ability of elementary school mathematics teachers, attitude towards the teaching profession, and self-concept were developed by the researcher. The instrument for the variable of teaching experience consisted of factual data about the number of years of teaching as a teacher.



Explanation:

- X1 : Attitude towards the Teaching Profession
- X2 : Teaching Experience
- X3 : Self-Concept
- Y : Teaching Ability of Elementary School Mathematics Teachers

**Figure 1. Constellation of the problem**

The instrument for the teaching ability variable of elementary school mathematics teachers was developed in the form of observation sheets used by three observers to assess the performance of teachers during the mathematics teaching process in grade I. To obtain good items from the pilot study, an analysis of each statement and its descriptors was conducted. The observation sheet consisted of 29 statements accompanied by descriptors as assessment references for the observers, and it was tested to 30 teachers in Yogyakarta teaching in grade I. The reliability coefficient for the teaching ability instrument was found to be 0.87. In addition to finding the reliability coefficient for individual instrument items, the reliability coefficient for ratings was also calculated, resulting in a value of 0.93. The instrument for attitude towards the teaching profession consisted of 48 statement items, with a reliability coefficient of 0.91.

Data obtained from the teaching experience variable were factual data. In this study, the instrument was simply a personal identity sheet containing the number of years of teaching. The self-concept instrument used in this study consisted of 40 statement items, with a reliability coefficient of 0.89.

### Data Analysis Techniques

Statistical analysis was used to test the research hypotheses. Data analysis techniques included the analysis prerequisites, which involved testing data normality and data homogeneity. The normality test of the data used Lilliefors's Lilliefors (Sudjana, 1996: 466-467). Data were considered normal if the  $L_o$  value was less than  $L_t$  at a significance level of  $\alpha = 0.01$ . Data homogeneity was tested using the Bartlett test (Sudjana, 1996: 261-264). Data were considered homogeneous if  $\chi^2_{count} < \chi^2_{table}$  with a significance level of  $\alpha = 0.01$ .

Linear data linearity and the significance of regression were tested using ANOVA tables (Sudjana, 2019: 15-22). Linear regression was considered highly significant if the F-value was less than the F-table value at a significance level of  $\alpha = 0.01$ .

To answer the research hypotheses, correlation and regression analysis techniques were used. The first, second, and third hypotheses used simple regression and correlation. The correlation formula used was Pearson's product-moment correlation and was tested using the t-test. The fourth hypothesis was analyzed using multiple regression and correlation through an F-test.

## FINDINGS AND DISCUSSION

### Findings

#### Analysis Prerequisites

The testing of normality for the regression residual error of the dependent variable Y against the independent variables was conducted using the Lilliefors method, and the results confirmed that normality was met. The homogeneity test was performed using the Bartlett test, and it was satisfied, where  $\chi^2_{count} < \chi^2_{table}$ . Therefore, the variance groups of Y over X<sub>1</sub>, Y over X<sub>2</sub>, and Y over X<sub>3</sub> were homogeneous.

#### Hypothesis Testing

The first hypothesis states that there is a positive relationship between attitude towards the teaching profession (X<sub>1</sub>) and the teaching ability of elementary school mathematics teachers (Y).

Based on the calculation results, a relationship between X<sub>1</sub> and Y was obtained, as indicated by the regression equation  $\hat{y} = 51.11 + 0.31X_1$ . The results of significance and linearity testing for the regression equation are as follows:

**Table 1. List of ANOVA for Linear Regression  $\hat{y} = 51.11 + 0.31X_1$**

Source of Variance	df	SSR	MSR	F <sub>count</sub>	F <sub>table</sub>
					$\alpha =$
					0,05
					0,01
Total	40	438180,0	438180,0	-	
Reg (a)	1	435974,4	435974,4		4,10
Reg (b a)	1	1615,78	1615,78	104,096**	7,35
Residual	38	589,82	15,52		
Tune up	30	557,15	18,57	4,548**	3,08
Error	8	52,67	4,08		5,20

Description:

\*\* : Regression is highly significant

\* : Regression is linear

df : Degrees of freedom

SSR : Sum of squares regression

MSR : Mean sum of squares

Based on the significance test of the regression and the linearity test, it can be said that the relationship between the pair of data, attitude towards the teaching profession (X<sub>1</sub>), and mathematics teaching ability (Y) is highly significant and linear.

Regression equation:

$\hat{Y} = 51.11 + 0.31X_1$ , indicating that for every one-point increase in the attitude score towards the teaching profession, there is a corresponding increase of 0.31 points in mathematics teaching ability at the constant value of 51.11. The strength of the relationship between X<sub>1</sub> and Y is indicated by the correlation coefficient rY<sub>1</sub>, which is 0.86. The regression equation's graph is shown in the following figure.

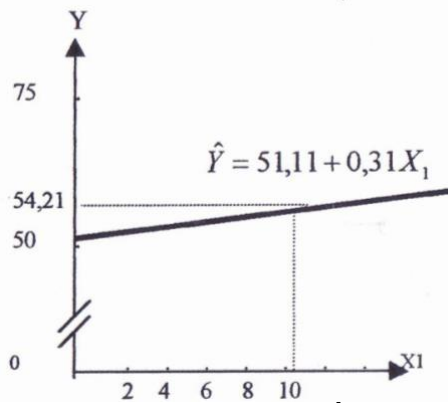


Figure 2. Regression Line Graph  $\hat{Y} = 51.11 + 0.31X_1$

Next, the significance and importance test of the correlation coefficient is listed in the following table.

Table 2. Significance Test of the Correlation Coefficient between Attitude towards the Teaching Profession and Mathematics Teaching Ability

The Correlation Coefficient	$t_{count}$	$t_{table}$	
		$\alpha = 0,05$	$\alpha = 0,01$
0,86	10,329**	1,1684	2,428

Description:

\*\* : The correlation coefficient is highly significant ( $t_{count} = 10.329 > 2.428 = t_{table}$ )

Based on the significance test of the correlation coefficient above, it can be concluded that the correlation coefficient between attitude towards the teaching profession ( $X_1$ ) and the ability to teach mathematics ( $Y$ ) at 0.86 is highly significant. The coefficient of determination is  $r_{Y12} = (0,8587)^2 = 0,7374$  or 73.74%, which means that 73.74% of the variance in the ability to teach mathematics ( $Y$ ) can be explained by the variable attitude towards the teaching profession ( $X_1$ ).

The partial correlation coefficient between attitude toward the teaching profession ( $X_1$ ) and the ability to teach mathematics ( $Y$ ) is  $r_{Y1.2} = 0.7030$  when the influence of the variable teaching experience ( $X_2$ ) is controlled. This is the condition under which the correlation coefficient is calculated. This analysis is then followed by a "t" test to determine the significance of the relationship between  $X_1$  and  $Y$ . The calculated t-value is 6.013.

If the influence of the variable self-concept ( $X_2$ ) is controlled, the partial correlation coefficient between attitude towards the teaching profession ( $X_1$ ) and the ability to teach mathematics ( $Y$ ) is  $r_{Y1.3} = 0.6365$ . This analysis is then followed by a "t" test to determine the significance of the relationship between  $X_1$  and  $Y$ . The calculated t-value is 5.020.

When the influence of variables  $X_2$  and  $X_3$  is controlled, the partial correlation coefficient between  $X_1$  and  $Y$  is  $r_{Y1.23} = 0.639$ . This analysis is then followed by a "t" test to determine the significance of the relationship between  $X_1$  and  $Y$ . The calculated t-value is 4.986. The summary of the significance test of the partial correlation coefficient is shown in the table below.

Table 3. The summary of the significance test of the partial correlation coefficient

correlation coefficient (Partial)	n	df	$t_{value}$	$t_{table}$	
				$\alpha = 0,05$	$\alpha = 0,01$
$r_{Y1.2} = 0,7030$	40	37	6,013**	1,686	2,432
$r_{Y1.3} = 0,6365$	40	37	5,020**	1,686	2,432
$r_{Y1.23} = 0,639$	40	36	4,986**	1,688	2,432

Description :

\*\* : highly significant

Based on Table 3 above, it can be stated that the partial correlation coefficient between attitude towards the teaching profession and the ability to teach mathematics, when controlling

for teaching experience and self-concept, is highly significant. The results of this simple relationship analysis conclude that there is a highly significant positive relationship between attitude towards the teaching profession and the ability to teach mathematics.

Testing the first hypothesis provides information that the ability to teach mathematics is significantly influenced by the attitude towards the teaching profession, with a contribution of 73.74%. This means that a more positive attitude towards the teaching profession can enhance one's ability to teach mathematics.

The second hypothesis states that there is a positive relationship between teaching experience ( $X_2$ ) and the ability to teach mathematics ( $Y$ ).

The relationship between  $X_2$  and  $Y$  is represented by the regression equation  $\hat{Y} = 80.64 + 1.09X_2$ . The ANOVA table summarizing the significance testing and linearity of the relationship is shown in the table below.

**Table 4. ANOVA Table for Linear Regression  $\hat{Y} = 80.64 + 1.09X_2$**

Source of Variance	df	SSR	MSR	$F_{value}$	$F_{table}$ $\alpha =$ 0,05 0,01
Total	40	438180,0	438180,0	-	
Reg (a)	1	435974,4	435974,4		
Reg (b   a)	1	1383,21	1383,21	63,913**	4,10 735
Residual	38	822,39	21,64		
Tune up	15	364,26	24,28	1,219**	2,12 2,93
Error	23	458,13	19,92		

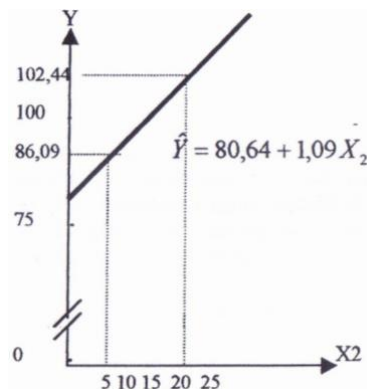
Description:

- \*\* : Regression is highly significant
- \* : Regression is linear
- df : Degrees of freedom
- SSR : Sum of squares regression
- MSR : Mean sum of squares

Based on the significance testing of regression and the linearity of the relationship, it can be said that the relationship between the pair of teaching experience data ( $X_2$ ) and the ability to teach mathematics ( $Y$ ) is highly significant and linear.

The regression equation:

$\hat{Y} = 80.64 + 1.09X_2$  indicates that there is an increase of 1.09 in the score of the ability to teach mathematics for every increase of one teaching experience score, with a constant of 80.64. The strength of the relationship between  $X_2$  and  $Y$  is represented by the correlation coefficient  $r_{YX_2}$ , which is 0.79. The graph of the regression equation can be seen in Figure 2 below.



**Figure 3. Regression Line Graph  $\hat{Y} = 80,64 + 1,09X_2$**

To determine the significance of the correlation coefficient, hypothesis testing using the "t-test" was conducted. The summary of the significance test of the correlation coefficient is shown in Table 5 below.

**Table 5. Significance Test of the Correlation Coefficient between Teaching Experience and Mathematics Teaching Ability**

correlation coefficient $r_{Y2}$	$t_{value}$	$t_{table}$	
		$\alpha = 0,05$	$\alpha = 0,01$
0,79	8.018**	1,684	2,428

Description:

\*\* : The correlation coefficient is highly significant ( $t_{value} = 8,018 > 2,428 = t_{table}$ )

Based on the significance test of the correlation coefficient above, it can be stated that the correlation coefficient between teaching experience ( $X_2$ ) and the ability to teach mathematics (Y) of 0.79 is highly significant. The coefficient of determination is  $r_{Y22} = (0.7928)^2 = 0.6285$  or 62.85%. This means that 62.85% of the variance in teaching mathematics ability (Y) can be explained by teaching experience ( $X_2$ ).

After accounting for other independent variables, such as attitude towards the teaching profession ( $X_1$ ), the partial correlation coefficient between teaching experience ( $X_2$ ), and the ability to teach mathematics (Y) is  $r_{Y2.1} = 0.534$ . The analysis proceeds with a "t" test to ascertain the significance of the correlation between teaching experience ( $X_2$ ) and the ability to teach mathematics (Y), resulting in a calculated t-value of 3.838. the partial correlation coefficient between  $X_2$  and Y, after accounting for the variable self-concept ( $X_3$ ), is  $r_{Y23} = 0.362$ . An analysis is continued with a "t" test to determine the significance of the relationship between  $X_2$  and Y, resulting in a calculated t-value of 2.364. When controlling for two independent variables,  $X_1$  and  $X_3$ , the partial correlation coefficient between teaching experience ( $X_2$ ) and the ability to teach mathematics (Y) is  $r_{Y213} = 0.369$ . An analysis is continued with a "t" test to determine the significance of the relationship between  $X_2$  and Y, resulting in a calculated t-value of 2.381. A summary of the test results is provided in Table 6 below.

**Table 6. Summary of Partial Correlation Coefficient Significance Tests**

Partial Correlation Coefficient	n	df	$t_{value}$	$t_{table}$	
				$\alpha = 0,05$	$\alpha = 0,01$
$r_{Y2.1} = 0,534$	40	37	3,838**	1,686	2,432
$r_{Y2.3} = 0,362$	40	37	2,364*	1,686	2,432
$r_{Y2.13} = 0,369$	40	36	2,381*	1,688	2,432

Description :

\*\* : highly significant

\* : significant

According to the information provided in Table 6, the partial correlation coefficient between teaching experience and the ability to teach mathematics, while taking into account attitude towards the teaching profession, is highly significant and should not be disregarded. When controlling for self-concept, it is still significant and cannot be ignored. These results remain significant when controlling for both  $X_1$  and  $X_3$ . The analysis of this simple relationship concludes that there is a significant positive relationship between teaching experience and the ability to teach mathematics.

This result provides information that the ability to teach mathematics is strongly influenced by teaching experience, with a contribution of 62.85%. The amount of teaching experience can determine the ability to teach mathematics.

The third hypothesis states that there is a positive relationship between self-concept and the ability to teach mathematics. The relationship between self-concept ( $X_3$ ) and the ability to teach mathematics (Y) is shown by the regression equation:  $\hat{Y} = 41.67 + 0.41X_3$ . The summary of significance testing and linearity of the relationship is presented in the following table.

**Table 7. List of ANOVA for Linear Regression**

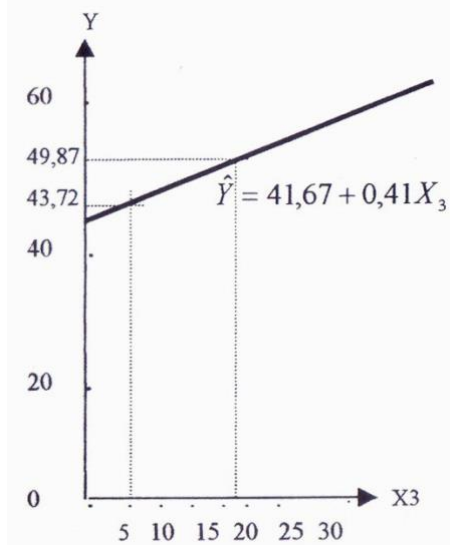
Source of Variance	df	SSR	MSR	F <sub>value</sub>	F <sub>table</sub> α =	
					0,05	0,01
Total	40	438180,0	438180,0	-		
Reg (a)	1	435974,4	435974,4	69,078**		4,10
Reg (b   a)	1					7,35
Residual	38	782,74	20,60			
Tune up	24	644,74	26,86	2,725*		2,35
Error	14	138,00	9,86			3,43

Description:

- \*\* : Regression is highly significant
- \* : Regression is linear
- df : Degrees of freedom
- SSR : Sum of squares regression
- MSR : Mean sum of squares

Based on the significance test of regression and the linearity of the relationship, it can be concluded that the correlation between the pair of self-concept data (X<sub>3</sub>) and the ability to teach mathematics (Y) is both highly significant and linear.

The regression equation:  $\hat{Y} = 41.67 + 0.41X_3$  indicates that each increase of one point in the self-concept score leads to an increase of 0.41 points in the ability to teach mathematics, with a constant of 41.67. The strength of the relationship between X<sub>3</sub> and Y is represented by the correlation coefficient r<sub>Y3</sub>, which is 0.80. The regression equation can be seen in Figure 3 below.



**Figure 4. Regression Line Graph  $\hat{Y} = 41,67 + 0,41X_3$**

To determine the significance of the correlation coefficient, a hypothesis test using the "t" test was conducted. The summary of the significance test for the correlation coefficient is presented in Table 8 below.

**Table 8. Significance Test of the Correlation Coefficient between Self-concept and Mathematics Teaching Ability**

Correlation Coefficient	t <sub>value</sub>	t <sub>table</sub>	
		α = 0,05	α = 0,01
r <sub>Y3</sub> 0,80	8,182**	1,684	2,428

Description:

- \*\* : The correlation coefficient is highly significant (t<sub>value</sub> = 8,182 > 2,428 = t<sub>table</sub>)



The significance test of the correlation coefficient above indicates that the correlation coefficient between self-concept ( $X_3$ ) and mathematics teaching ability ( $Y$ ) of 0.80 is highly significant. The coefficient of determination is  $r_{Y32} = (0.7987)^2 = 0.6379$ , which means that 63.79% of the variance in mathematics teaching ability ( $Y$ ) can be explained by self-concept ( $X_3$ ).

When controlling for other predictor variables, such as attitude towards the teaching profession ( $X_1$ ), a partial correlation coefficient of 0.4241 is found between self-concept ( $X_3$ ) and mathematics teaching ability ( $Y$ , denoted as  $r_{Y3.1}$ ). An analysis was then conducted using the "t" test to determine the significance of the relationship between  $X_3$  and  $Y$ , resulting in a t-value of 2.849. When controlling for the variable of teaching experience ( $X_2$ ), a partial correlation coefficient between  $X_3$  and  $Y$  is obtained, which is  $r_{Y3.2} = 0.3911$ . An analysis was then conducted using the "t" test to determine the significance of the relationship between  $X_3$  and  $Y$ , resulting in a t-value of 2.585. When controlling for both variables  $X_1$  and  $X_2$ , a partial correlation coefficient between self-concept ( $X_3$ ) and mathematics teaching ability ( $Y$ ) is obtained, which is  $r_{Y3.12} = 0.4104$ . An analysis was then conducted using the "t" test to determine the significance of the relationship between  $X_3$  and  $Y$ , resulting in a t-value of 2.700. The summary of the test results in Table 9 below.

**Table 9. Summary of the Significance Test of Partial Correlation Coefficients**

Partial Correlation Coefficient	N	df	t <sub>value</sub>	t <sub>table</sub>	
				$\alpha = 0,05$	$\alpha = 0,01$
$r_{Y3.1} = 0,4241$	40	37	2,849 **	1,686	2,432
$r_{Y3.2} = 0,3911$	40	37	2,585 **	1,686	2,432
$r_{Y3.12} = 0,4104$	40	36	2,700 **	1,688	2,432

Description :

\*\* : highly significant

Based on Table 9 above, it can be inferred that the partial correlation coefficient between teaching ability in mathematics and self-concept, when controlling for attitude towards the teaching profession, is very significant. Similarly, when controlling for teaching experience, it remains relevant. The same holds when controlling for both variables; the results are still very significant. The analysis of this simple relationship concludes that there is a highly significant positive relationship between self-concept and the ability to teach mathematics. This result provides information that the ability to teach mathematics is greatly influenced by self-concept, with a contribution of 63.79%.

The fourth hypothesis posited that there is a positive relationship between attitude towards the teaching profession, teaching experience, self-concept, and the ability to teach mathematics for elementary school teachers.

A multiple linear regression analysis between attitude towards the teaching profession ( $X_1$ ), teaching experience ( $X_2$ ), and self-concept ( $X_3$ ) together with the ability to teach mathematics ( $Y$ ) is represented by the following multiple regression equation:

$$\hat{Y} = 52.62 + 0.21X_1 + 0.45X_2 + 0.05X_3.$$

No test for the linearity of multiple regression was performed, under the assumption that if the three simple regression models are linear, the multiple regression model is also linear. A test for the normality of the regression residuals was performed using the Lilliefors method, resulting in a value of  $L_o = 0.1270$ , while the critical value ( $L_t$ ) at a significance level of 0.01 is 0.1630. Therefore,  $L_o = 0.1270 < 0.1630 = L_t$ . It can be said that the residuals in the multiple linear regression equation are normally distributed. Furthermore, a test for the significance of the multiple linear regression model was conducted using the F-statistic, as summarized in Table 10 below.

**Table 10. ANOVA Summary for Multiple Linear Regression:  $\hat{Y} = 52.62 + 0.21X_1 + 0.45X_2 + 0.05X_3$**

Source of Variance	df	SSR	MSR	$F_{hitung}$	$F_{tabel}$
					$\alpha =$
					0,05
					0,01
Total corrected	39	2205,60			
Residual	3	1339,13	613,04	10,18	60,22**
Regresion	36	366,47			2,80
					4,38

Description :

\*\* : highly significant

Based on the significance test above, it means that the multiple regression equation:  $\hat{Y} = 52.62 + 0.21X_1 + 0.45X_2 + 0.05X_3$  is highly significant and linear. After testing the significance of multiple regression, the next step is to test the multiple correlations of variables  $X_1$ ,  $X_2$ , and  $X_3$  with variable  $Y$ . By using multiple correlation analysis, the calculation results in a multiple correlation coefficient  $R_{Y.123}$  of 0.91; and the coefficient of determination  $R^2_{Y.12} = (0.913)^2 = 0.8338$  or 83.38%. This indicates that the attitude towards the teaching profession ( $X_1$ ), teaching experience ( $X_2$ ), and self-concept ( $X_3$ ) collectively account for 83.38% of the variability in the ability to teach mathematics ( $Y$ ). Next, a test of the significance of the multiple correlation coefficient is conducted using an F-test. The calculated F-value is 60.152. A summary of the calculations is shown in the table below.

**Table 11. Summary of the Significance Test of the Multiple Correlation Coefficient**

Multiple Correlation Coefficient $R_{Y.123}$	$F_{value}$	$F_{tabel}$	
		$\alpha = 0,05$	$\alpha = 0,01$
0,91	60,152**	2,80	4,38

Description:

\*\* : The correlation coefficient is very significant and meaningful

Therefore, the alternative hypothesis, which claims that the combination of attitude towards the teaching profession, teaching experience, and self-concept does not contribute positively to the teaching ability of elementary school mathematics teachers is disproven. The testing provides information that the ability to teach mathematics is significantly influenced by attitude towards the teaching profession, teaching experience, and self-concept, with a contribution of 83.38%. This means that the positivity of one's attitude towards the teaching profession, the extent of teaching experience, and the positivity of self-concept can determine the ability to teach mathematics.

The ranking of the strength of the relationship between the three independent variables: attitude towards the teaching profession ( $X_1$ ), teaching experience ( $X_2$ ), and self-concept ( $X_3$ ), with the dependent variable, namely the ability to teach mathematics ( $Y$ ), can be seen in the following table:

**Table 12. Ranking of Partial Correlation Coefficients.**

Partial Correlation between	Partial Correlation coefficient	Rank	Variable
$X_1$ with $Y$	$r_{Y1.23} = 0,639$	First	Attitude
$X_2$ with $Y$	$r_{Y2.13} = 0,369$	Second	Experience
$X_3$ with $Y$	$r_{Y3.12} = 0,410$	Third	Self-concept

From the table above, it shows that the highest partial correlation coefficient is the variable "sikap terhadap profesi guru" which translates to "attitude towards the teaching profession.

## **DISCUSSION**

### **Improving Attitudes towards the Teaching Profession**

Considering the significant contribution of the attitude towards the teaching profession compared to the other two variables, it is imperative that special attention should be given to nurturing this attitude. Cultivating one's attitude towards a profession can be achieved through interactions with others, such as fellow teachers, school principals, involvement in professional organizations, and other activities related to the profession.

It is reasonable to anticipate that a teacher's ability to teach will also improve if a teacher's attitude towards their profession becomes more positive. For this reason, efforts should be made to ensure that teachers have a positive attitude towards their work. How a teacher views and behaves in their profession significantly affects their success in teaching.

In order to cultivate a more positive attitude towards their profession, teachers should experience a sense of the value of their work in enhancing children's learning, derive pleasure from their tasks, and attain a state of contentment with their chosen profession. They should also carefully consider their actions before carrying them out. Additionally, they should be open to receiving advice from colleagues and be willing to seek advice from their peers without considering their status. Furthermore, they should have varied concerns and high hopes for their students' success. These factors will affect the quality of teaching performed by teachers. Naturally, by adopting such attitudes, teachers will be more than willing to continue their education continuously to keep up with developments in their field of expertise and technology.

School principals are expected to continue to encourage, guide, and motivate teachers in matters related to teaching and other school duties. Through these efforts, teachers are expected to have a positive attitude towards their work, be motivated, and always be passionate about carrying out their duties.

In addition to fulfilling their duties in the classroom, teachers should also actively participate in professional organizations as a platform to gain knowledge and develop their professional skills. In an organization, teachers must uphold and adhere to the applicable code of ethics.

Apart from paying attention to experienced teachers, teacher education programs should also be considered. Fostering attitudes in prospective teachers is an initial step that needs to be instilled. The Elementary School Teacher Education Program, as an institution tasked with producing elementary school teachers, must play a significant role in developing a positive attitude towards the teaching profession. Approaches that can be taken to teach a positive attitude towards the teaching profession include providing knowledge and skills to prospective teachers, sharing the teacher's profile, providing a conducive teaching environment, instilling a sense of admiration in prospective teachers for those with positive attitudes, and providing reinforcement every time prospective teachers display the desired attitude.

### **Improving Teaching Experience**

To broaden their horizons, teachers should be more active in participating in both in-class and extracurricular activities. This can be done in groups with fellow teachers with the aim of enhancing their teaching skills.

Efforts to improve the ability to teach mathematics can be supported by an increase in teaching experience. These efforts can be carried out through workshops and seminars, both in the field of mathematics teaching materials and in education in general.

Another effort is to provide opportunities for teachers to teach mathematics not only in specific classrooms but also through periodic exchanges, even in other schools. This activity will undoubtedly increase teachers' teaching experience in handling mathematics instruction for students at all grade levels.

The implementation of exchanges or internships at other schools should be tailored to effective learning time, school conditions, teacher domiciles, and the geographical location of schools. Through this program, it is hoped that teachers' abilities in conducting teaching and learning activities will be enhanced.

Experience development should also begin when prospective teachers are in the Elementary School Teacher Education Program (PGSD). Prospective teachers should not only be given teaching practice in a relatively short period but should also be given more time to apply their knowledge in schools.

### **Self-Concept Improvement**

The research findings suggest a positive relationship between self-concept perception of elementary school mathematics teachers and their teaching proficiency. Self-concept perception contributes significantly, amounting to 63.79%, to the teaching ability of elementary school mathematics teachers. Therefore, it can be said that the presence of self-concept can enhance the teaching ability of elementary school mathematics teachers.

Many factors can contribute to the formation of a teacher's self-concept. In addition to the psychological aspects within themselves, various external factors also play a role, including their position, teacher career development, work environment, technical and procedural regulations governing teachers' operational tasks in teaching, as well as assessments or recognition of work achievements.

This means that there needs to be special attention given to external factors affecting teachers to form a reasonable self-concept in order to enhance the teaching ability of elementary school mathematics teachers. The significance of self-concept indicates that those involved in teacher development and quality improvement efforts should strive to ensure that each teacher is shielded from factors that could reduce their self-concept regarding their role and function as an elementary school teacher.

### **CONCLUSION**

The teaching ability of 1st-grade elementary school teachers can be significantly improved when several key factors align. Firstly, maintaining a positive and enthusiastic attitude towards the teaching profession, as this outlook fosters a genuine passion in more positive ways. Moreover, by nurturing a positive attitude towards teaching, they have more teaching experience, and their self-concept is also more positive.

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