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Research Article

Research exploration and learning practices for prospective mathematics teachers

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ABSTRACT

In the world of education, a study has quite a large influence on education practitioners. This study aims to analyze the relationship between research and learning practices for prospective mathematics teachers. In this context, researchers will explore the understanding of prospective mathematics teachers on existing research related to the practice of teaching mathematics prospective teachers. The research method used in this study is a quantitative research method with the type of research used in this research is correlational. The results of this study are in line with the research objectives, namely wanting to see whether there is an influence on research with learning practices for prospective mathematics teachers. The data shows that there is an influence between research on learning practices for prospective mathematics teachers.

Keywords: Research Exploration; Learning Practices; Prospective Mathematics Teachers; Mathematics Learning

1. INTRODUCTION

The development of human resources is an important thing in supporting national development, one of which can be done through education. Education is something that is the obligation of every human being in the world. Education plays a role in providing knowledge with various aspects that encompass it, starting from cognitive, affective, psychomotor, and pedagogic aspects. In the 2003 National Education System Law Article 1 (Motors & Europe, 2003), explained that education is a conscious and planned effort to create a learning atmosphere and learning process so that students actively develop their potential to have religious spiritual strength, self-control, personality, intelligence, noble character, and the skills needed by themselves, society, nation and state.

Education plays a role in preparing the younger generation as the nation's successors who can face the challenges of the times and adapt to technological growth (Hashifah et al., 2022). The government determines the goals of national education which are contained in Law Number 20 of 2003 concerning the national education system article 3(Motors & Europe, 2003), states that the goal of national education is to develop the potential of students to become human beings who have faith and are devoted to God Almighty, have noble character, are healthy, knowledgeable, capable, creative, independent and become democratic and responsible citizens.

The weak development of education is none other than due to the low development of human resources. The quality of educators is a determinant of the success of educational development in Indonesia. Educator in this case is a teacher, who has a fundamental role in the learning process with students (Rasyid, 2015). The teaching and learning process is a process that contains a series of teacher and student actions on the basis of reciprocal relationships that take place in educative situations to achieve certain goals. The teacher as a teacher or educator is one of the determining factors for the success of any educational effort. Educational efforts to improve the quality of human resources always lead to the teacher factor. Quality teachers will produce quality human resources as well (Yulianto & Khafid, 2016). The teacher is the most decisive component in the education system as a whole, which must receive central, first and foremost attention which is always a strategic focus when talking about education issues, because teachers are always related to every component in the education system. In addition, the teacher is also the component that most influences the creation of quality educational processes and outcomes (Burhan & Sauga, 2017).

Therefore, prospective teachers can conduct research before carrying out their duties as a teacher. Research can be conducted at the student level, at which time teacher candidates are developing their abilities to become competent teachers. One way for prospective teachers to develop their competence and knowledge is to conduct research that can develop the potential of prospective teachers to become competent prospective teachers. (Sutikno, 2018).

As is the case with research conducted by (Febriyanti et al., 2022), where his research focuses on the education of prospective teachers of mathematics which aims to describe the knowledge of prospective teachers about students' mathematical reasoning processes. The research subjects were prospective mathematics teacher students the chosen by purposive sampling. It was found that prospective teachers still had difficulties in analyzing students' reasoning processes, using the meaning of terms in everyday life, and only considering the correct reasoning processes. There is also research conducted by (Pasandaran & Jumarniati, 2019) This study aims to explain how mathematics works in a problem, and how mathematical reasoning can shape our mindset. Until it leads to a conclusion that the goals of learning mathematics must experience a reorientation. Furthermore, there is research conducted by (Attard & Holmes, 2022) it is concluded that students' learning experiences in mathematics can be enhanced through various blended learning approaches by allowing various points of access to more learning opportunities. aligned with individual learning needs and free from classroom constraints. However, none of these studies have discussed in detail or specifically about Research Exploration And Learning Practices For Prospective Mathematical Teacher. This research will involve prospective mathematics teacher students as research subjects. Data will be collected via google form. In this study, researchers will explore various aspects including the relationship between research and learning practices for prospective mathematics teachers. Researchers will also explore the opinions of prospective mathematics teachers on existing research.

2. RESEARCH METHOD

The research method used in this study is a quantitative research method with the type of research used in this research is correlational, correlational research is research that is intended to determine the existence of a relationship between two or several variables (Arikunto Suharsimi, 2007). This study aims to analyze the effect of research on learning practices for prospective mathematics teachers. In this context, the researcher will explore the understanding of prospective mathematics teachers on existing research related to the practice of teaching mathematics prospective teachers. This study uses research instruments (Broekkamp & Van Hout-Wolters, 2007) modified by researchers to focus on prospective teachers in Jabodetabek, this is because the ability and access of researchers is limited to prospective mathematics teachers. The data collection technique was through a survey using the Google form by inviting each respondent's representative from a university in DKI Jakarta. Respondents in this study were 68 students majoring in Mathematics Education from different universities. Furthermore, the data collected was tested for the validity and reliability of the items. From the results of the validity and reliability trials on variable X, 10 valid and reliable questionnaire items were obtained, while 12 questionnaire items were obtained for valid and reliable Y variables.

3. RESULTS AND DISCUSSION

The researcher conducted prerequisite tests including descriptive analysis and inferential analysis on the questionnaire data that had been given. Descriptive data analysis aims to display the conditions or characteristics of the sample data for each research variable. The data that has been obtained is then processed using Microsoft Excel. Here is the output of the frequency distribution.

Table 1. Descriptive Analysis

	X		Y
Mean	27,85	Mean	33,03
Standatd Error	0,443	Standatd Error	0,613
Standard Deviation	3,654	Standard Deviation	5,052
Kurtosis	0, ,574	Kurtosis	0,574
Skewness	0,123	Skewness	0,199
Range	22	Range	26
Minimum	18	Minimum	22
Maximum	40	Maximum	48
Sum	1894	Sum	2246

To find out whether the data used is normally distributed or not, a normality test is performed. The normality test is used when the number of sample data or observations is less than 30. The normality test is used to see whether the error term is close to a normal distribution. If the number of sample data or observations exceeds 30, then a normality test is not needed because the distribution of the sampling error term is close to normal (Ajija, 2011). In this study, the normality test was carried out using the Kolmogorov-Smirnov test. The basis for decision-making in the Kolmogorov-Smirnov test is if the significance value is > 0.05, then the data is said to be normal. And the data is said to be abnormal if the significance value is < 0.05. In this study, the normality test was carried out using the help of the IBM SPSS Statistics application.

Table 2. Normality test (One-Sample Kolmogorov-Smirnov Test)

			Unstandardized Residual
	N		68
Normal Parameters	Mean		,0000000
	Std. Deviation		2,33504180
Most Extreme Differences	Absolute		,099
	Positive		,099
	Negative		-,061
	Test Statistic		,099
	Asymp. Sig. (2-tailed)		,095
Monte Carlo Sig. (2-tailed)	Sig.		,099
	99% Confidence Interval	Lower Bound	,092
		Upper Bound	,107

Based on the data Table 2, it can be seen that the significant value is 0.107. So, it can be concluded that the data obtained above is normally distributed. Because of its significant value (0,099 > 0,05) (Brown & Motulsky, 1997). To test linearity in this study, the authors used the help of the IBM SPSS Statistics application.

Table 3. Linearity Test (ANOVA Table)

			Sum of Squares	df	Mean Square	F
Learning Practice * Research	Between Groups	(Combined)	1297,041	17	76,297	9,239
		Linearity	1107,410	1	1107,410	134,101
		Deviation from Linearity	189,632	16	11,852	1,435
	Within Groups		412,900	50	8,258	
	Total		1709,941	67		

Based on the results of the Table 3, it can be seen that the significance value of the Deviation from Linearity is 0.164. In making decisions on the linearity test, the data is said to be linear if the significance value is > 0.05. And the data is said to be non-linear if the significance value is < 0.05. In this way, it can be concluded that there is a linear relationship between the student perspective variable (X) and the mathematics learning variable integrated within technology (Y). Next, a hypothesis test was carried out, namely a simple linear regression analysis. Simple linear regression analysis is used to determine whether there is an influence between the independent variables and the dependent variable. The following are the results of a simple linear regression analysis using the help of the IBM SPSS Statistics application.

Table 4. Simple Linear Regression Analysis Test ($ANOVA^a$)

Models		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1107,410	1	1107,410	121,303	< ,001b
	Residual	602,532	66	9,129		
	Total	1709,941	67			

Based on the results of the data Table 4, it can be seen that the calculated F value = 121.303 with a significance level of 0.001 < 0.005, so the regression model can be used to predict research variables or in other word there is an effect of the research variable (X) on the learning practice variable for prospective mathematics teachers (Y).

Then the researcher conducted a T test. This test was conducted to see the effect of the independent variable on the dependent variable by comparing the ttabel value with tcount. Tcount can be seen in Table 5.

Table 5. T Test

Models		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2,039	2,838		,719	,475
	Research	1,113	,101	,805	11,014	< ,001

Based on the **Table 5**, it can be seen that the independent variable (research) has a tcount of 11.014. Next is to calculate t_{table} using the formula a/2 = 0.05/0.025, degrees of freedom (df) n-2 = 95-2 = 93. Then looking at the t distribution **Table 6**, we get a t_{table} of 1.986. Because $t_{count} > t_{table}$, then H0 is rejected and H1 is accepted. It can be concluded that there is an influence between research and learning practices for prospective mathematics teachers.

The coefficient of determination aims to see what the percentage level of influence of the independent variable is on the dependent variable. The following is the output of the coefficient of determination **Table 6.**

Table 6. The coefficient of determination (Model Summary)

Models	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,805a	,648	,642	3,021

It can also be seen from the Model Summary table above that the correlation/relationship (R) value is 0.805. From this output, it is obtained a coefficient of determination (R Square) of 0.648, which implies that the influence of the independent variable (research) on the dependent variable (learning practices for prospective mathematics teachers) is 64.2%.

4. CONCLUSION

The results of this study are in line with the purpose of the study, namely wanting to see whether there is an influence on research with learning practices for prospective mathematics teachers. Data shows that there is an influence between research on learning practices for prospective mathematics teachers. The results of the distribution of questionnaires or questionnaires on variable X is that the study is known to be 40 and the lowest value is 18. The result is the result of the distribution of questionnaires or questionnaires on the variable Y, namely learning practices for prospective mathematics teachers whose highest value is 48 and the value The lowest is 22. Furthermore, the results of normality trials in both variables, namely learning mathematics integrated with technology and student perspective using IBM SPSS Statistics get the conclusion that the data is normal with ASYMP numbers. Because the significance value (0.099 > 0.05). Furthermore, the linearity test that can be seen the significance value on deviation from linearity is 0.164. Then it is stated that there is an influence between research and learning practices for prospective mathematics teachers. Furthermore, a simple linear regression test is carried out obtained the value of f count = 121,303 with a significance level of 0.001 < 0.005, so the regression model can be used to predict the research variable or in other words there is an influence of research variables (X) on learning practice variables for prospective mathematics teachers (Y). Furthermore, the t test was carried out and obtained t_{count} of 11,014 and was also t_{table} with a degree of freedom of 93 which was 1,986. Because $t_{count} > t_{table}$, H0 is rejected and H1 is accepted. It can be concluded that there is an influence between research and learning practices for prospective mathematics teachers. Furthermore, the analysis of the coefficient of determination and the value obtained by R Square is 0.648 which contains the understanding of the independent variable (research) on the dependent variable (learning practice for prospective mathematics teachers) is 64.2%.

CONFLICT OF INTEREST

There are no conflicts of interest declared by the authors.

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