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The Impact of Research Methodology and Statistics Mastery on the Quality of Student Theses in Elementary School Teacher Education Department

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ABSTRACT

Thesis is one of the biggest challenges for students. This is because students often do not understand how to write a thesis as a scientific paper. This research was carried out to examine the mastery of research methodology and statistics on the quality of student thesis. The research method used in this study is quantitative research. The results of this study then found a positive and very significant relationship between mastery of educational research methodology material and the quality of the thesis. Then a positive and very significant relationship was also found between the level of student mastery of the statistics course material and thesis quality. Finally, the hypothesis testing concluded that between the variables of student mastery of research methodology material and statistics course material, there was a positive and very significant relationship with the thesis quality of university students.

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1. INTRODUCTION

Students in higher education often conduct research as part of a capstone project, such as a report or thesis. An undergraduate thesis is a study document discussing a particular field or issue based on the results of expert-written literature reviews, field research, or development (experiments). Students must complete a thesis as part of the curriculum for their chosen field of study in order to graduate. As the conclusion of a student's academic career, the thesis is an undertaking that demands their undivided attention and effort from the very beginning until it is submitted for evaluation. Not understanding the problem to be studied, having trouble obtaining literature, not knowing the procedure of producing scientific papers, and not being used to writing scientific papers are common issues that students have when writing theses. Most students struggle with thesis writing due to a lack of familiarity with and comprehension of the scientific work's method, which necessitates the ability to

think and act to explore and develop scientific knowledge in order to contribute to the expert's field (Sá, Santos, & Serpa, 2021).

Higher education is a vehicle for producing experts who are expected to be able to develop science and technology and contribute to development. To go to higher education, the centre of science and technology development. The life of the scientific community is reflected in the life of the civitas academica, which includes student life (Sima, Gheorghe, Subić, & Nancu, 2020). As the last level of formal education, tertiary institutions also prepare experts in various branches of science and art. This goal is achieved through the *Tridharma* of higher education, namely teaching, research, and community service activities. These three functions complement each other and cannot be separated, and they aim to educate the nation and develop the Indonesian people as a whole. Realizing this noble aspiration, the academic community of higher education is a very important element. In applying the Tridharma of Higher Education, the position of students is not only as an appreciation of knowledge but also as processors of knowledge through the ability to reason, discovery, creativity, and passion for research (Simamora, De Fretes, Purba, & Pasaribu, 2020).

Students can learn to think like scientists if they engage in independent study to test hypotheses and confirm or refute hypotheses. These cutting-edge fields of study are essential in today's rapidly evolving technology society. Without the growth of basic science through investigation, technological advancement is impossible. To get students more invested in research, we need to help them become more proficient with the concepts introduced in courses like educational research methods and statistics. A nation's ability to develop its people resources, industry, and technology will be called into question if colleges and institutions do not foster an atmosphere conducive to research (Zamora-Polo & Sánchez-Martn, 2019).

Research methodology and statistics are essential to adequately present learning experiences that foster attitudes, abilities, and research skills in students. Besides developing mastery of the material, it is hoped that the courses will also provide learning experiences that foster scientific attitudes, abilities, and research skills. According to Mikkelsen, the research methodology includes theory and indirectly includes operations such as methods. Koenjaraningrat further stated that research methodology is knowledge about various research methods. Methodology is the study of methods. Margaret stated that research methodology discusses theoretical concepts, evaluates methods, and examines their strengths and weaknesses. Statistics is a science that relates statistical data and facts or a scientific study to data collection techniques, data processing techniques, data analysis techniques, drawing conclusions, and making policies/decisions with strong justifications based on accurate data and facts (Al-Samarraie, Shamsuddin, & Alzahrani, 2020).

Methodology is the study of methods. Margaret and Hilda stated that the research methodology discusses the theoretical concepts of various methods and examines their advantages and disadvantages. The methodology is a means and way of obtaining knowledge and understanding of theory from researchers included in this term. Central to any methodology is its conception of reality and the causal effects or effects that are the basis for creating new knowledge and its validity. The way the researcher relates to the people being studied, his behavior in collecting information, and what he does with that information all stem from concepts, specifically regarding reality and causal effects. In other words, the methodology is a unitary philosophy with abstraction and investigative methods. From the various explanations above, it can be concluded that research methodology is related to science and theory in research methods. At the same time, the method itself concerns the tools or techniques for conducting research (Wang, Wang, Wipfli, Thacker, & Hart, 2023).

Statistics is intricately connected to and significantly contributes to research endeavours, particularly in the realm of quantitative research. Put simply, the level of expertise a researcher has in Statistics greatly influences the quality of their research, particularly in data analysis and interpreting the outcomes of thesis data analysis. But, the higher the student's proficiency in the statistics course, the greater the calibre of the student's thesis (Manych, Müller-Hansen, & Steckel, 2023). Statistics is sometimes described as the application of logic and common sense combined with mathematical

operations. Another perspective asserts that statistics is a discipline that encompasses both theoretical and practical aspects, focusing on formulating, advancing, and using methods to account for uncertainties in inductive reasoning. Statistics is commonly defined as the scientific discipline that investigates the collection, processing, display, and analysis of data, as well as the methods used to make informed judgements (Findley, 2022). The quantitative research method is a commonly employed approach in research activities. Statistics is a method of analysing data commonly employed to examine quantitative research findings. The issue lies in the fact that the instructional materials and textbooks solely focus on statistics in isolation, without establishing its connection to research. The instruction focuses on the computation of statistical measures such as the mean, median, and mode, as well as conducting hypothesis tests using t-tests, F-tests, ANOVA, and similar methods. The primary emphasis is on the calculation aspect rather than the use of these techniques in the analysis of research data (Lemon & Hayes, 2020).

Hence, in the undergraduate programme, students must acquire proficiency in the fundamental principles of their field of specialisation, along with knowledge and research methodology, in order to effectively address challenges within their domain. They are expected to possess the ability to identify, comprehend, elucidate, and devise problem-solving strategies specific to their area of expertise. Consequently, students are required to possess a solid grasp of the scientific approach, enabling them In order for students to successfully complete a scientific thesis, it is typically necessary for them to have completed certain prerequisite courses, such as Statistics and Research Methodology. Proficiency in statistics and research technique is crucial for students nearing the completion of their education. Statistics courses for students of social sciences provide valuable skills that are very applicable in future professional settings. Professions that involve accurate data collection, thorough data analysis, and a strong understanding of social sciences necessitate skills such as interpreting survey results or statistical data, utilising statistical analysis methods to draw conclusions, summarising the characteristics of the subjects being studied (including individuals, groups, and organisations), and creating reports based on statistical analyses. For instance, in a research project, students are required to utilise their understanding of statistics in many fields such as the natural sciences, biology, commerce, and industry (Dimova, 2020).

In social sciences, including educational research and natural sciences, scientists use statistics for at least three purposes: data collection (through survey activities or experiments), hypothesis testing, and theory development. However, the reality is that there are still many students who are less able and unskilled in using the statistical knowledge they have obtained from their statistics lectures. Likewise, with the results of methodology lectures or research methods, students must understand techniques for taking representative sample data and appropriate research sampling methods which follow the population's characteristics. In other words, if a student has passed scientific writing, statistics, and research methodology courses, then they have strong and adequate abilities to write a thesis; so, it is hoped that he will not experience difficulties in compiling his thesis when he finishes the thesis he has compiled is of high quality (Iqbal, Qureshi, Ashraf, Rasool, & Asghar, 2021).

Other researchers have undertaken research on students' theses. In collaboration with Venning & Buisman-Pijlman (2013), Venning has effectively included an evaluation matrix for providing feedback to enhance skills and knowledge in research activities within postgraduate programmes at Australian institutions. Willison & Buisman-Pijlman (2016) have developed a programme that effectively enhances research skills for PhD candidates during their time as students. The study's primary objective was to investigate the effects of implementing the RSD framework on different majors during the semesters leading up to students obtaining their Doctorate degrees. According to Bandaranaike's (2018) research, it is crucial to cultivate study knowledge in order to acquire the necessary skills for the future workforce. Mataniari et al. (2020) have demonstrated the cognitive acuity of students in the Biology programme at a university in Indonesia using a research framework. Willison's (2018) research effectively describes the actions that educators commonly engage in when

they support students' research endeavours by enhancing their skills in thoroughness and seriousness through in-depth exploration.

According to data obtained from the Academic Administration Section of the PGSD Department at a University in Kendari, there is significant variation in the time required to complete this thesis for the 2019-2020 Academic Year. The most efficient students are capable of finishing their thesis within a three-month timeframe, while the least efficient students require up to one year and six months to complete their thesis. In order for students to effectively complete thesis writing, they must possess specific skills in conducting scientific research. These skills are demonstrated through their proficiency in research methodology and statistics courses, which provide them with the knowledge to comprehend the methods, procedures, and structure of writing scientific papers. Composing a thesis is a straightforward task due to the presence of a thesis supervisor who guides students throughout the process. The thesis supervisor offers valuable guidance on both the technical parts of writing and the methodological components employed in thesis research. Insufficient comprehension of research methods and statistics courses among students will impede their ability to write a thesis, so compromising the accuracy of their academic pursuits (Elmore, 2021). This study investigates the topic by performing a study on the examination of research technique and statistics mastery and its impact on the quality of university students' theses.

2. METHODS

This research will be carried out using a quantitative approach through survey methods. Simultaneously, there are three steps taken. The first step is to determine the criteria used in evaluating the student thesis, the second step is to evaluate the student thesis as a sample, and the third step, conduct a correlational design to obtain information about the relationship between the independent variables (X1 = Mastery of Educational Research Methodology Material, and X2 = Mastery of Statistics Material) and the dependent variable Y = Thesis Quality. Then, test the hypothesis using inferential statistics. Apart from the students, this study's population is also the characteristics of the thesis elements of PGSD FKIP UHO students in the 2016-2020 graduation year period. This study used a random sampling technique by taking members of the study population who were considered homogeneous and had the same characteristics.

3. FINDINGS AND DISCUSSION

3.1 Normality Test

The normality test of data distribution aims to determine whether or not the distribution of sample data from the study population is normal, using the Lilliefors Test for normality, arguing that the advantage of the Liliefors Test for normality is that it is a simpler calculation method, and is strong enough even with a small sample size. The summary of the results of the Estimated Error Normality Test is presented in Table 1 below:

Table 1. Summary of Test Results for Estimated Error Normality Requirements

Estimate Error	N	Normality Test		Conclusion
		LO_{count}	LO_{table} (α = 0.05)	
Quality of Thesis of PGSD FKIP UHO Students (Y) for Mastery of Statistics (X_1)	55	0.789	0.886	Normal
Quality of PGSD FKIP UHO Student Thesis (Y) for Mastery of Research Methodology (X_2)	55	0.40628	0.886	Normal
Mastery of statistics (X_1) over Mastery of Research Methodology (X_2)	55	0.8289	0.886	Normal

Explanation:

a. Ns = non-significant ($LO_{count} < LO_{table}$), meaning the error in estimating Variable Y data on X1 data is normally distributed. Quality of PGSD FKIP UHO Student Thesis (Y) for Mastery of Statistics Material (X_1), Quality of PGSD FKIP UHO Student Thesis (Y) for Mastery of Research Methodology Material (X_2)
b. LO_{count} = The largest absolute price of Lilieforst obtained from the difference between the standard score opportunities with a proportion that is smaller or equal to the expected standard score
c. LO_{table} = Critical value of the Lilieforst test at the significance level ($\alpha = 0.05$).

Based on Table 1, the normality test results for variable data (Y) = Thesis Quality of PGSD FKIP UHO Students, variable data X_1 = Mastery of Statistics. $LO_{count} = 0.573$ less than $L_{table} = 0.89$ at $\alpha = 0.05$, it can be concluded that the data is normally distributed, variable data Student Thesis Quality (Y) on variable data (X_2) = Mastery of Research Methodology. $LO_{count} = 0.406$ is smaller than $LO_{table} = 0.89$ at $\alpha = 0.05$, and it can be concluded that the data is normally distributed. The variable data of the Research Methodology $LO_{count} = 0.8289$ is smaller than $LO_{table} = 0.89$ at $\alpha = 0.05$, so it can be concluded that the data is normally distributed. Since the test results for the normality requirements of the research data show that $LO_{count} < LO_{table}$ at a significant level of $\alpha = 0.05$, it is emphatically concluded that the three problem variables of this study are normally distributed.

3.2 Homogeneity Test

To test the homogeneous requirements of the data is to test whether the variances of two or more distributions are the same. The homogeneity of variance test is used to compare two or more variables. The test criteria used are two distributions that are said to have a homogeneous distribution of data if the value $\chi^2_{count} < \chi^2_{table}$ at $\alpha = 0.05$ and degrees of freedom ($dk_1 = n_1\text{-}1$) and ($dk_2 = n_2\text{ -}1$). Testing the homogeneity of the variance of the three groups of variable research data was carried out using the Bartllet formula. Calculations for testing the 3 data groups at a significant level of $\acute{\alpha} = 0.05$ as a result of hypothesis testing are presented in Table 2 below:

Table 2. Summary of Test Results for Joint Variance Homogeneity Terms

Variance	N	Normality Test		Conclusion
		X^2 count	X^2 table ($\alpha = 0.05$)	
Quality of Thesis of PGSD FKIP UHO Students (Y) for Mastery of Statistics (X_1)	55	12.337	33.924	Homogeneous
Quality of PGSD FKIP UHO Student Thesis (Y) for Mastery of Research Methodology (X_2)	55	21.506	52.400	Homogeneous
Mastery of statistics (X_1) over Mastery of Research Methodology (X_2)	55	19.194	35.046	Homogeneous

Explanation:
If the results are $\chi^2_{count} < \chi^2_{table}$, then the data is homogeneous
Dk = degrees of freedom
n = the number of data groups
χ^2_{count} = Chi-square obtained from the results of calculations with the Barlett formula
χ^2_{count} = Chi-square taken from the table at a significant level $\alpha = 0.01$.

Based on the results of the data analysis presented in Table 10, the values are obtained: a) for the variable data group Thesis Quality of PGSD FKIP UHO Students, Statistics course obtained $\chi^2_{count} = 12.337 < \chi^2_{table} = 33.924$ at $\alpha = 0.05$. So, it can be concluded that the data group fulfills the homogeneous requirements; b) for the variable data group PGSD FKIP UHO Student Thesis Quality (Y) on Mastery of Statistics (X_1), $\chi^2_{count} = 21.506 < \chi^2_{table} = 52.400$ at $\alpha = 0.05$. So, it can be concluded that the data group is homogeneous; and c) for the variable data group Mastery of Statistics Subject for Mastery of Research Methodology $\chi^2_{count} = 19.194 < \chi^2_{table} = 35.046$ at $\alpha = 0.05$. So, it can be concluded that the data group fulfils the homogeneous requirements, so it is said to be feasible or meets the requirements of hypothesis testing with inferential statistical data.

The homogeneity test of the distribution of student thesis quality data for 5 study groups to elementary schools in the PGSD FKIP UHO Department, seen from the elements of the title, problems,

literature review, research methods, results, and discussion, as well as conclusions and suggestions intended to test the requirements for analysis of variance.

Table 3. Homogeneity Test of Variance Thesis Quality of PGSD FKIP UHO Students

Db1	Db2	Two Parties Significance	Conclusion
3	196	0.0215	Homogeneous

3.3 First Hypothesis Testing

The essence of the first hypothesis states that "there is a positive relationship between mastery of statistics in the Research Methodology course (X_1) with the thesis quality of PGSD FKIP UHO students (Y)". From the hypothesis statement, it can be assumed that the higher the mastery score of the Statistics course material on Research Methodology, the higher the thesis quality score index of PGSD FKIP UHO Students. And or conversely, the lower the value of statistical mastery of the research methodology, the lower the thesis quality score. The results of successive empirical data analysis are described below:

The linear regression equation model X_1 over Y is $\hat{Y} = a + b X_1$. Then following the results of the constant coefficients table with a = 1.992 and b = 0.468.

Table 4. Constant Coefficient (a = 1.992 and b = 0.468)

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.992	5.473		.364	.717
	X1	.468	.066	.699	7.106	.000

a. Dependent Variable: Y

From this table of coefficients, the constants and coefficients of the linear regression equation are obtained from column B, namely: $\hat{Y} = 1.992 + 0.468 X_1$. The Linearity Test and the Significance of the linear regression equation are determined based on the ANOVA Table, ANOVA table, and the Summary Model[b] table as follows:

Table 5. ANOVA Table

ANOVA Table

			Sum of Squares	df	Mean Square	F	Sig.
Y * X1	Between Groups	(Combined)	1020.083	10	102.008	8.813	.000
		Linearity	746.184	1	746.184	64.470	.000
		Deviation from Linearity	273.899	9	30.433	2.629	.160
	Within Groups		509.262	44	11.574		
	Total		1529.345	54			

Hypothesis:

$H_0 = \alpha + \beta X$ (Linear regression)

$H_1 \neq \alpha + \beta X$ (non-Linear regression)

The linearity test of the regression line equation was obtained from the Deviation from the Linearity line, namely F_{hit} (Tc) = 2.629 with P_{Value} = 0.16 > 0.05. This means that H_0 is accepted or the Y regression equation over X_1 is linear or a linear line.

Table 6. ANOVA[b] Table

Tabel ANOVA[b]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	746.184	1	746.184	50.498	.000[b]
	Residual	783.161	53	14.777		
	Total	1529.345	54			

a. Dependent Variable: Y

b. Predictors: (Constant), X1

Statistical hypothesis:

H_0: ß ≤ 0 (insignificant regression)

H_1: ß >0 (mean regression)

The linearity test of the regression line equation is obtained from the Deviation from the Linearity row, namely column 5, F_{hit} (b/a) = 50.498, with P_{value} = 0.0001 <0.05, meaning H_0 is rejected. Thus, the Regression of Y over X_1 is significant.

Test the Significance of the correlation coefficient X_1 and Y

Statistical Hypothesis

H_0: ϱ ≤ 0

H_1: ϱ > 0

To test the significance of the correlation coefficient Y on X_1 is presented in the Summary Model[b] table below:

Table 7. Model Summary[b]

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.699[a]	.488	.478	3.844	.488	50.498	1	53	.000	1.547

a. Predictors: (Constant), X1

b. Dependent Variable: Y

Based on the Model Summary[b] table above, in the first row, the correlation coefficient (r_{xy}) = 0.699 and F_{hit} (F_{change}) = 50.498, with P_{value} = 0.0001 <0.05. This means H_0 is rejected. Thus, the correlation coefficient X_1 over Y is significant. Meanwhile, the coefficient of determination from the table above can be seen in the second row, namely R Square = 0.488, which implies that 48.8% of the variance in the quality of the thesis PGSD FKIP UHO students (graduation year from 2016 to 2021) can be explained by their mastery of research methodology.

3.4 Second Hypothesis Testing

The essence of the second hypothesis reads that "there is a positive relationship between the mastery of PGSD FKIP UHO alumni students on research methodology course material (X_2) with the thesis quality variable (Y). From this hypothesis, it can be assumed that the higher the student's mastery score of the research methodology course material, the higher the thesis quality score, and conversely that the lower the mastery of the research methodology course material, the lower the thesis quality score. Linear regression equation $\hat{Y} = a + b X_2$

The results of the Linear Regression analysis X_2 = Mastery of Lecture Material Research methodology on Y = Thesis quality of PGSD FKIP UHO alumni students. The results of the analysis listed in the printout of SPSS Version 15.0 present a table of constant coefficients (a = -0.982 and b = 0.520).

Table 8. Constant Coefficient (a = -0.982 and b = 0.520)

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations		
		B	Std. Error	Beta			Zero-order	Partial	Part
1	(Constant)	-.982	4.605		-.213	.832			
	X2	.520	.057	.781	9.097	.000	.781	.781	.781

a. Dependent Variable: Y

Based on this table of coefficients, the constant values and coefficients of the linear regression equation are obtained from column B, namely: $\hat{Y} = -0.982 + 0.520\ X_2$. Linearity Test and Significance of the Linear Regression Equation between Y and X_2 Testing the linearity and significance of the regression equation is determined based on the ANOVA Table, ANOVA[b], and the Model Summary[b] table as follows:

Table 9. Anova Table

ANOVA Table

			Sum of Squares	df	Mean Square	F	Sig.
Y * X2	Between Groups	(Combined)	1019.545	15	67.970	5.200	.000
		Linearity	932.237	1	932.237	71.317	.000
		Deviation from Linearity	87.308	14	6.236	.477	.932
	Within Groups		509.800	39	13.072		
	Total		1529.345	54			

Statistical hypothesis:

H_0: Y = α + ßX1 (linear regression)

H_1: Y ≠ α + ßX1 (non-linear regression)

The linearity test of the regression line equation was obtained from the Deviation from the Linearity line, namely F_{hit} (Tc) = 0.477, with P_{value} = 0.932 > 0.05. This means that H_0 is accepted or the Y regression equation over X_1 is linear or in the form of a linear line.

Table 10. Anova[b]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	746.184	1	746.184	50.498	.000[b]
	Residual	783.161	53	14.777		
	Total	1529.345	54			

a. Dependent Variable: Y

b. Predictors: (Constant), X1

Statistical hypothesis:

H_0: ß ≤ 0 (insignificant regression)

H_1: ß > 0 (mean regression)

The linearity test of the regression line equation is obtained from the Deviation from the Linearity row, namely column 5, F_{hit} (b/a) = 50.498, with P_{value} = 0.0001 <0.05, meaning H_0 is rejected. Thus, the Y regression over X_2 is significant or significant.

Test the significance of the correlation coefficient X_2 and Y

Statistical hypothesis:

H_0: ϱ ≤ 0

H_1: ϱ > 0

To test the significance of the correlation coefficient Y on X_2 is presented in the Model Summary[b] table below:

Table 11. Model Summary[b]

Model Summaryb

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.781[a]	.610	.602	3.357	.610	82.746	1	53	.000	1.892

a. Predictors: (Constant), X2

b. Dependent Variable: Y

Based on the Model Summary[b] table above, in the first row, the correlation coefficient (r_{xy}) = 0.781 and F_{hit} (F_{change}) = 82.746, with P_{value} = 0.0001 <0.05. This means H_0 is rejected. Thus, the correlation coefficient X_2 over Y is significant. At the same time, the coefficient of determination from the table above is also seen in the second row, namely R Square = 0.610, which means that 61% of the variation in the value of the thesis quality variable for PGSD FKIP UHO alumni students can be explained by their mastery of research methodology course material.

3.5 Third Hypothesis Testing

Below we will see the details in multiple linear equations. Existing details will be explained in table form as follows:

Table 12. Multiple Linear Equations

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations		
		B	Std. Error	Beta			Zero-order	Partial	Part
1	(Constant)	-3.602	4.900		-.735	.466			
	X1	.138	.095	.206	1.455	.152	.699	.198	.124
	X2	.410	.094	.616	4.357	.000	.781	.517	.370

a. Dependent Variable: Y

From the Coefficients table above, the constants b0 = -3.602, b1 = 0.138, b2 = 0.410 are obtained in column B. So, the Double Regression equation is $\hat{Y}$= -3.602 + 0.138X_1 + 0.410X_2. Next will be seen regarding the significance test of the multiple regression equation, which will be explained in the following table:

Table 13. Significance Test of Multiple Regression Equations

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	955.596	2	477.798	43.304	.000[b]
	Residual	573.750	52	11.034		
	Total	1529.345	54			

a. Dependent Variable: Y

b. Predictors: (Constant), X2, X1

Hypothesis:

H_0: The multiple regression equation is meaningless

H_1: Double regression equation means

The linearity test of the regression line equation was obtained from the Deviation from the Linearity row, column 5, namely F_{count} = 43.304 and P_{value} = 0.000 <0.05. This means H_0 is rejected. Thus, the multiple regression equation $\hat{Y}$= -3.602 + 0.138X_1 + 0.410X_2 is significant or significant.

Next, it will be seen that the significance test of the multiple correlation coefficient is carried out. Using the statistical hypothesis H_0: ϱy.12 ≤ 0 and H_1: ϱy.12 > 0, the following table shows the results of the multiple correlation coefficient significance test:

Table 14. Significance Test of Multiple Correlation Coefficients

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.790[a]	.625	.610	3.322	.625	43.304	2	52	.000	1.779

a. Predictors: (Constant), X2, X1

b. Dependent Variable: Y

The significance test of the multiple correlation coefficient is obtained from the Model Summary table above. It can be seen in the first row that the double correlation coefficient (Ry.12 = 0.790 and F_{count} (F_{change}) = 43.304, and P_{value} = 0.000 <0.05. This means that H_0 is rejected. Thus, the multiple correlation coefficient between X_1 and X_2 with Y is significant.

While the coefficient of determination from the table above is also seen in row 2, namely R-Square = 0.625, which means that 62.5% of the variation in values on the thesis quality variable of PGSD FKIP UHO students (Y) can be explained by statistical knowledge (X_1) and joint mastery of Research Methodology (X_2) course material.

Then, the following results from the Significance test of the coefficient of the multiple regression equation:

Table 15. Test of Significance of Coefficient of Multiple Regression Equation

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations		
		B	Std. Error	Beta			Zero-order	Partial	Part
1	(Constant)	-3.602	4.900		-.735	.466			
	X1	.138	.095	.206	1.455	.152	.699	.198	.124
	X2	.410	.094	.616	4.357	.000	.781	.517	.370

a. Dependent Variable: Y

From the table of coefficients above, it can be seen that the results of the t-test for each of the coefficients X_1 and X_2, namely: t_1 = 1.455 and P_{value} = 0.152 > 0.05. This means that H_0 is accepted and t_2 = 4.357 and P_{value} = 0.000 < 0.05. This means that H_0 is rejected, so the multiple regression equation is significant. With the correlation between X_1 and Y by controlling for the effect of X_2 (y.1.2), the following results of the partial correlation significance test:

Table 16. Partial Correlation Significance Test

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.790[a]	.625	.610	3.322	.625	43.304	2	52	.000	1.779

a. Predictors: (Constant), X2, X1

b. Dependent Variable: Y

Correlations

Control Variables			Y	X1	X2
-none-[a]	Y	Correlation	1.000	.699	.781
		Significance (2-tailed)	.	.000	.000
		Df	0	53	53
	X1	Correlation	.699	1.000	.800
		Significance (2-tailed)	.000	.	.000
		Df	53	0	53
	X2	Correlation	.781	.800	1.000
		Significance (2-tailed)	.000	.000	.
		Df	53	53	0
X2	Y	Correlation	1.000	.198	
		Significance (2-tailed)	.	.152	
		Df	0	52	
	X1	Correlation	.198	1.000	
		Significance (2-tailed)	.152	.	
		Df	52	0	

a. Cells contain zero-order (Pearson) correlations.

From the results of the analysis in the table above, it is found that (r.y1.2) = 0.699 and P_{value} = 0.001 < 0.05, then H_0 is rejected or H_1 is accepted, thus the correlation coefficient between X_1 and Y by controlling for variable X_2 is significant. The correlation between X_2 and Y by controlling for the effect of X_1 is obtained (ry2.1) = 0.781 and P_{value} = 0.001 < 0.05, then H_0 is rejected, or H_1 is accepted, thus the correlation coefficient between X_2 and Y by controlling the variable X_1 is significant.

3.6 Disscussion

The essence of the first hypothesis states that "there is a positive relationship between mastery of statistics in the Research Methodology course (X1) with the thesis quality. The test result showed that the correlation coefficient X_1 over Y is significant. Meanwhile, the coefficient of determination from the table above can be seen in the second row, namely R Square = 0.488, which implies that 48.8% of the variance in the quality of the thesis PGSD FKIP UHO students (graduation year from 2016 to 2021) can be explained by their mastery of research methodology. Science and theory influence research methodology. Meanwhile, the research process involves research instruments and methods. As Hans says, choosing the research technique leads to the researcher's research sequence, not studying the approach. Research methods should be differentiated into three categories: the method, processes, and data gathering methods. The method is the research process, the procedure is the task to be done, and the technique is the data collection instruments (Casula, Rangarajan, & Shields, 2021).

The essence of the second hypothesis reads that "there is a positive relationship between the mastery of PGSD FKIP UHO alumni students on research methodology course material (X_2) with the thesis quality variable (Y). From the findings, it is known that H_0 is rejected. Thus, the correlation

coefficient X_2 over Y is significant. At the same time, the coefficient of determination from the table above is also seen in the second row, namely R Square = 0.610, which means that 61% of the variation in the value of the thesis quality variable for PGSD FKIP UHO alumni students can be explained by their mastery of research methodology course material. The evaluation of a thesis's quality in thesis writing is commonly done by applying a metaphysical perspective. This is due to the exceptional quality of the thesis. Furthermore, it must not only align closely with the ideals, but also meet specified criteria. This aligns with Delors' perspective, which defines quality as pertaining to a product or activity that fulfils pre-established standards. In addition, it is asserted that the outcomes of high-quality work must encompass three components: (1) reliability, denoting adherence to established rules and fulfilment of promised deliverables; (2) certainty, signifying the fulfilment of expectations to instill confidence; and (3) physical evidence, indicating the presence of comprehensive supporting evidence (Mundher et al., 2022).

Research is the careful, methodical, and patient investigation of a topic to learn new information or establish new standards. The terms cautious and systematic are intended to convey the idea that research must be done very carefully and in a very specific way. An indicator of good or high-quality research is when the process can be explained to others so that it may be repeated to test the validity and dependability of the newly discovered information (Williams Jr., Clark, Clark, & Raffo, 2021). High-quality research, as defined by Schulte, involves a multi-step process that begins with planning and continues through the gathering of data, analysis, and presentation of findings. This means that the earlier steps in the study sequence form the basis for the next. Meanwhile, Race noted that credible and dependable research is considered to be of high quality. According to Eisenhart and Borko, three criteria determine whether or not a study can be considered valid: (1) its originality and significance; (2) its compatibility with other studies in the field; and (3) its adherence to established norms for the reliability of its measuring instruments (Pauliuk, Koslowski, Madhu, Schulte, & Kilchert, 2022).

A thesis as a research report is the product of rigorous scientific work; as such, it should adhere to the conventions established by Fraenkel and Wallen, who state that any respectable scientific report consists of four parts: (1) an introduction; (2) the body; (3) the references; and (4) the appendices. The introduction also notes that the document has a title page, table of contents, list of figures, and list of tables. The bulk of the document is divided into five parts: (1) an overview of the issue being investigated, which covers (a) the reasons for doing the study, (b) the expected outcomes, (c) the primary questions and hypotheses, and (d) a glossary of key concepts; (2) research into applicable theories, (3) methods that detail (a) the study's design, (b) the sample, (c) the data collection instruments, (d) the procedures themselves, (e) a discussion of the study's internal validity, and (f) a description and justification of the statistical methods employed, (5) summary, conclusions, recommendations, and proposals (Hayashi Jr., Abib, & Hoppen, 2019) based on the findings (Hayashi Jr., Abib, & Hoppen, 2019).

On the basis of the preceding descriptions, it can be concluded that the quality of the thesis is the conformity between the student's thesis and the standards that must be included in scientific research reports employing scientific methods and procedures. These standards include problems, theoretical studies, hypotheses, populations and sampling techniques, testing the validity and reliability of instruments, research methods, data analysis techniques, conclusions and recommendations (Fahd, Miah, Ahmed, Venkatraman, & Miao, 2021).

4. CONCLUSION

The regression test results concluded that there was a positive and very significant relationship between mastery of educational research methodology material (X1) and the quality of the thesis (Y). This means the higher the mastery of the methodology material, the higher the thesis quality score. The strength of the relationship between the variable mastery of research methodology material (X1) and the quality of the thesis (Y) is indicated by the regression coefficient ry1 of 0.464, and the closeness of

the relationship is indicated by the coefficient of determination r2y1 of 0.2153. Then, the strength of the relationship between the level of student mastery of statistical material and thesis quality equals 43.84. Then, the relationship's closeness level can be seen based on the coefficient of determination r2y2 of 0.4384 and the correlational relationship between the level of student mastery of statistical material and the thesis quality of ry2 of 0.6621. Thus, it was concluded that the variation in grades that occurred in improving the thesis quality by 43.84% was determined by the level of mastery of the statistics course material. The results of the hypothesis testing concluded that between the variables of student mastery of research methodology material and statistics lecture material, there was a positive and very significant relationship with the thesis quality of students at 34.64%. This research was only limited to one university in Kendari. Further research could be carried out on a larger sample representing several universities with the same level of education.

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