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Resource Management Of Educational Facilities And Infrastructure In Improving The Quality Of Education In Primary Schools: A Quantitative Analysis

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Abstract

Resource Management Of Educational Facilities And Infrastructure In Improving The Quality Of Education In Primary Schools. This research aims to determine the influence of educational facilities and infrastructure resources on improving the quality of education in elementary schools. This research uses descriptive quantitative methods. The participants involved consisted of 10 people including 5 principals and 5 deputy principals, each of whom came from 5 schools in the cluster of 35 SDN Lamreung, Aceh Besar Regency, namely SDN Lamreung, SDN Rumpet, SDN Lam Ujong, SDN Gla Meunasah Baro and SD Arrisilah Bilingual School. This research data collection technique uses observation, interviews and questionnaires. Research data analysis uses a qualitative approach obtained from observations and interviews, and a quantitative approach obtained from the results of filling out a questionnaire which is then processed using prerequisite tests and hypothesis testing using SPSS version 25.00. The results of this research show that the T test shows tcount 4.809 which is greater than ttable 2.306 At the level of significance, it can be concluded that there is an influence of facility and infrastructure resource management on increasing the quality of education in elementary schools.

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INTRODUCTION

Education is one of the main pillars in the development of a country, where every citizen has the right to proper and quality education. In Indonesia, this right is guaranteed by the 1945 Constitution and further regulated by Law Number 20 of 2003 concerning the National Education

System. This law outlines the basic principles of education which include aspects of equality, justice, accessibility and quality, as well as establishing the active role of government, society and the private sector in providing education (Brewis, 2019; Ofianto et al., 2025; Šebart et al., 2021). With this legal basis, the Indonesian education system aims to empower every individual to have the knowledge, skills and character needed to contribute positively to nation building (Abdullah et al., 2019; Iriany & Paciana, 2019; Rohimah et al., 2024).

Education is the main foundation in individual formation and the development of a nation (Fitzgerald et al., 2023; Ma'arif, 2018; Mulyani et al., 2024). As a system that not only transfers knowledge, but also shapes character and skills, education has a crucial role in shaping the future. In it, the quality of education is the key, because good quality will create graduates who are competent and competitive (Dicker et al., 2019; Nauffal & Skulte-Ouais, 2018). With high quality education, a country can achieve its full potential and open up opportunities for progress in various fields (Schroeder et al., 2019).

Based on the findings of direct observations carried out, it is known that the condition of the facilities and infrastructure resources of the 35 Lamreung Elementary School cluster, many buildings such as classrooms, student study rooms, UKS rooms, principals' rooms, teachers' rooms and toilets are damaged. Meanwhile, many learning tools are lacking, such as incomplete sports equipment, very small parking spaces, no places of worship available, damaged fences, ceremonial fields need to be repaired and several facilities and infrastructure resources that need repair and improvement. Cluster 35 SDN Lamreung is one of the clusters located in region V in Krueg Barona Jaya District. The cluster of 35 SDN Lamreung consists of SDN Lamreung, SDN Rumpet, SDN Lam Ujong, SDN Gla Meunasah Baro and SD Arrilahan Bilingual School. The poor condition of infrastructure can directly affect the quality of education by hampering the effectiveness of the learning process and the comfort of students and teachers in the school environment. Therefore, with good management of facilities and infrastructure resources, such as careful planning, proper procurement, regular maintenance and optimal use, educational institutions can overcome these problems and improve the quality of education significantly.

Facilities and infrastructure resource management has a very significant role in improving the quality of education (Irmayani et al., 2018; Kaso et al., 2021; Mulang, 2021). Education cannot be separated from the role of facilities and infrastructure which have a major impact in supporting the smooth implementation of the learning process. Research by Zulfa (2024) highlighted internal factors that influence the quality of education, including teacher quality, teacher careers, teacher welfare, education management in accordance with legislation, mastery of teaching methodology, student health, as well as the availability of appropriate educational facilities, infrastructure and facilities adequate. In accordance with Pratikno (2022), to improve the quality of education, it is important to pay attention to several components, including human resource management, curriculum, school management, learning process management, fund management, evaluation and partnerships.

The success of learning in schools is very dependent on the effective and efficient use of all available educational facilities and infrastructure (Eze et al., 2018; Kopp et al., 2019). The importance of resource management is reflected in efforts to create a comfortable and conducive environment for teachers and students while at school. In addition, the availability of adequate learning tools and facilities, both in terms of quality and quantity, and relevant to needs, is a key

factor in the education process. According to Siswanto (2020), educational facilities are equipment that is directly used in the learning process, while educational infrastructure is facilities that indirectly support the learning process. Management of educational facilities and infrastructure has the responsibility to organize and maintain so that these facilities and infrastructure can make an optimal contribution to the educational process. In Article 45 Paragraph 1 of the National Education System Law Number 20 of 2003, it is explained that, "Each formal and non-formal education unit provides facilities and infrastructure that meet educational needs in accordance with the growth and development of physical potential, intellectual intelligence, social, emotional and students' psychology." This management activity includes planning, procurement, supervision, storage, inventory and disposal of educational resources, as well as structuring to support effectiveness and efficiency in the overall implementation of education.

The aim of this research is to assess the influence of management of educational facilities and infrastructure on the quality of education in elementary schools. So the problem formulation in this research is whether resource management of facilities and infrastructure has an effect on improving the quality of education in elementary schools?

METHODS

This research uses quantitative methods. This research involved 10 participants including 5 principals and 5 deputy principals, each of whom came from 5 schools in the cluster of 35 Lamreung Elementary Schools, Aceh Besar District, namely Lamreung Elementary School, Rumpet Elementary School, Lam Ujong Elementary School, Gla Meunasah Baro Elementary School and Gla Meunasah Baro Elementary School. Arisala Bilingual School. The implementation of resource management for educational facilities and infrastructure can be seen in table 1.

Table 1. Implementation of Resource Management in Elementary Schools

Indicator	Activity
Planning	Proposed planning at the beginning of the learning year The proposal is submitted to the RKAS Meetings with the principal, deputy principal, teacher council and committee Proposed reports from each teacher council are held at a plenary meeting Carry out budget cost determination implementation of purchasing/procuring facilities and infrastructure resources
Procurement	Buy Make your own Receive Grants or assistance Renting Borrow Exchange or repair
Utilization	Computer training for students and teachers
Maintenance	Routine or continuous maintenance processes such as cleaning drainage channels from rubbish and dirt, cleaning rooms, yards, cleaning glass, windows, chairs, cupboards, mowing grass, bathrooms/toilets and others Periodic maintenance processes such as repairing or painting frames, doors, walls, roof tiles and other buildings that are dull or not in good condition.
Deletion	Repair what can still be repaired, what cannot be repaired will be placed in a

warehouse or on empty school land

Data collection techniques through observation and questionnaires. Observations were carried out to analyze the implementation of facility and infrastructure resource management in elementary schools. Meanwhile, questionnaires were given to participants to find out their perceptions after carrying out resource management of facilities and infrastructure.

The instrument used in this research used a questionnaire consisting of 20 statements related to the variables of management of facilities and infrastructure resources and quality of education with a Likert scale of 1-5. Before the questionnaire is distributed, the validity and reliability of the instrument is first tested. The test results can be seen in the following table.

Table 2. Instrument Validity Test Results

Variables and Indicators	Item	Pearson Correlation (r count)	r table	Information
Facilities and Infrastructure Resource Management (X)				
Planning	X1.1	0.616	0.444	Valid
	X1.2	0.701	0.444	Valid
	X1.3	0.579	0.444	Valid
Procurement	X2.1	0.636	0.444	Valid
	X2.2	0.602	0.444	Valid
Utilization	X3.1	0.892	0.444	Valid
	X3.1	0.732	0.444	Valid
Maintenance	X4.1	0.464	0.444	Valid
	X4.2	0.873	0.444	Valid
Removal	X5.1	0.566	0.444	Valid
	X5.2	0.589	0.444	Valid
Quality of Education (Y)				
Inputs	Y1.1	0.734	0.444	Valid
	Y1.2	0.487	0.444	Valid
	Y1.3	0.724	0.444	Valid
Process	Y2.1	0.825	0.444	Valid
	Y2.2	0.706	0.444	Valid
	Y2.3	0.648	0.444	Valid
Outputs	Y3.1	0.838	0.444	Valid
	Y3.2	0.646	0.444	Valid
	Y3.3	0.751	0.444	Valid

The instrument is said to be valid if $r \text{ count} > r \text{ table}$. If you look at the table above, it is obtained at a significance level of 0.05 using a two-sided test and $n = 20$, then the $r \text{ table}$ is obtained (0.444). All items or variables studied are declared valid because $r \text{ count} > r \text{ table}$. So the questionnaire instrument designed is valid.

In the reliability test, researchers used the alpha (α) method in the Cronbach Alpha model, which if the variable has a Cronbach Alpha (α) value > 0.60 then the variable can be said to be reliable. If the Cronbach's Alpha (α) value is smaller than 0.60 then the respondent's answer to the questionnaire is declared unreliable. The results of the reliability test on the questionnaire instrument can be seen in the following table.

Table 3. Instrument Reliability Results

Variable	Cronbach's Alpha (α)	Reliability Standards	Information
Facilities and Infrastructure Resource Management (X)	0.835	0.60	Reliable
Quality of Education (Y)	0.804	0.60	Reliable

The Cronbach's Alpha (α) values for the variables management of facilities and infrastructure resources (X) and quality of education (Y) are known to be 0.835 and 0.804 respectively based on the results of the reliability test above. Therefore, it can be concluded that all questionnaires in this study are reliable or consistent so they can be used as research instruments because the Cronbach's Alpha (α) value for X and Y is greater than 0.60.

Data analysis in this research uses qualitative and quantitative approaches. Qualitative analysis in this research is to determine the process of resource management of facilities and infrastructure that has been implemented in elementary schools obtained from the results of observations and interviews which can be seen in table 1. A quantitative approach is used to determine the influence of resource management of facilities and infrastructure on increasing the quality of education provided. analyzed using prerequisite tests and hypothesis testing with SPSS version 25.00.

RESULT

1. Descriptive Statistical Analysis

By using sample or population data, descriptive statistics are used to calculate variables such as average, minimum value, maximum value, variance, standard deviation, frequency distribution table, and so on, in order to explain or provide an overview of the subject under study.

Table 3 shows that the results of descriptive statistical analysis related to the variable score for management of facilities and infrastructure resources (X) obtained characteristics of an average score distribution of 97.88 and a variance of 78,548 with a standard deviation of 8,863 with the lowest score being 79 and the highest score being 113. from.

Table 4. Descriptive Statistics Results for Variable

Statistics	Statistical Value
Sample Size	10
Average	90.88
Standard Deviation	7,117
Variance	58,584
Lowest Value	77
The highest score	113

After examining the score for the facility and infrastructure resource management variable (X), the researchers were able to obtain a score distribution result of 91. When the scores were grouped into four categories, the infrastructure management results fell into the "Good" category. This makes sense if you look at the previous table.

distribution characteristics from the results of descriptive statistical analysis related to the Education Quality (Y) variable score obtained an average score of 91.88 and a variance of 59,548 with a standard deviation of 7,717 from the lowest score of 76 and the highest score of 112.

Table 5. Descriptive Statistics Results for Variable Y

Statistics	Statistical Value
Sample Size	10
Average	95.88
Standard Deviation	8,117
Variance	78,584
Lowest Value	80
The highest score	111

After examining the score for the education quality variable (Y), the researchers were able to obtain a score distribution of 96. When the scores were grouped into four categories, the results of infrastructure management fell into the "Good" category. This makes sense if you look at the previous table.

2. Prerequisite Test Analysis

This research carried out prerequisite tests using normality and linearity tests. The Kolmogorov-Smirnov test was used as a normality test in this study. The purpose of this normality test is to ensure the distribution of residual data in the research variables. Data with normally distributed residuals is good data and suitable for use in research. The residual data in this test is normally distributed if the significance value is smaller than 0.05, and is not normally distributed if the significance value is greater than 0.05. The table below displays the results of the Kolmogorov-Smirnov normality test.

Table 6. Normality test

One-Sample Kolmogorov-Smirnov Test		
		Unstandardized Residual
N		10
Normal Parameters, b	Mean	.0000000
	Std. Deviation	9.50349963
Most Extreme Differences	Absolute	,084
	Positive	,084
	Negative	-.066
Statistical Tests		,084
Asymp. Sig. (2-tailed)		.201c,d

Data on variables X (facilities and infrastructure resource management) and Y (quality of education) in the table above shows that the significance value is $0.201 > 0.05$. Thus, it can be concluded that the data in this study has a regularly distributed distribution.

The linearity test was also carried out by the researchers to ascertain whether there was a linear relationship or not between two variables. The independent variable (X) and dependent variable (Y) must have a linear relationship in good correlation. SPSS software version 25.00 can be used to test linearity. A significant value comparison of 0.05 can be used to assist in decision making. The independent variable (X) and dependent variable (Y) have a significant linear relationship if the deviation from the static value is greater than 0.05. The following table displays the findings from the linearity test.

Table 7. Linearity Test Results

ANOVA Table							
			Sum of Squares	df	Mean Square	F	Sig.
Quality of Education * Facilities and Infrastructure Management	Between Groups	(Combined) Linearity	451,000	3	111,499	3,546	,077
		Deviation from Linearity	408,602	1	406,501	14,25	,008
						8	
			43,299	3	13,122	,458	,722
	Within Groups			7	30,853		
	Total			10			

It is known that the sig value, or deviation from linearity, is 0.722 based on the linearity test in the anova table above. The conclusion is that there is a significant linear relationship between the infrastructure resource management variable (X) and the education quality variable (Y) when compared with a probability of 0.05 and the significance value is greater than the probability value ($0.722 > 0.05$).

3. Hypothesis Testing

Simple linear regression aims to test the influence between the independent variable (X) and the variable (Y). The results of the simple linear regression test can be seen in the following table.

Table 8. Hypothesis Test Results

Coefficients ^a					
Model	Unstandardized Coefficients		Standardized Coefficients		Sig.
	B	Std. Error	Beta	t	
1 (Constant)	64,572	15,160		3,890	,001
Infrastructure management	,800	,184	,470	4,809	,000

a. Dependent Variable: Quality of Education

Simple linear regression formula:

$$Y = a + bX$$

The simple linear regression can be seen from the Coefficients output results. These output values are entered into a simple linear regression formula, namely:

$$Y = 64.572 + .800X$$

With:

Y = Quality of Education

X = Facilities and Infrastructure Management

a = Constant number of unstandardized coefficients. From the output above the value is 64,572. This number is a constant number which means that if there is no Facilities and Infrastructure Management ($X=0$), then the consistent value of Education Quality (Y) is 64,572. b = Regression coefficient number. The value is 0.800. This figure means that for every additional 1 level of Facilities and Infrastructure Management (X), the Quality of Education (Y) will increase by 0.800.

The regression equation above can be interpreted as meaning that if the management of facilities and infrastructure increases by 1 unit, then the quality of education will increase by 0.800. Meanwhile, the intercept value of 64,572 shows the intersection point of the Y axis when

If viewed from the T Test, the significance level test $\alpha = 5\%$ which means that to make a decision to reject the correct hypothesis is 5% or 0.05. Table 8 shows that the significance level is 0.05 with $n = 10$ then $df = n - 2$, namely $10 - 2 = 8$. So the ttable value = 2.306. Thus it can be concluded that $t_{count} 4,809 \geq t_{table} 2,306$ with $\alpha = 0.05$ so that H_0 is rejected and H_1 is accepted. This means that there is an influence of the management aspect of infrastructure (X) on the quality of education (Y).

DISCUSSION

Based on the research results, it shows that there is an influence of resource management of facilities and infrastructure on the quality of education. The results of a simple linear regression test obtained the equation $Y = 64,572 + 0.800X$, which means that every one unit increase in facilities and infrastructure management (X) will increase the quality of education (Y) by 0.800. A constant value of 64,572 indicates the value of education quality when the management of facilities and infrastructure is zero. The T test results show that t_{count} of 4,809 is greater than t_{table} of 2,306 at a significance level of 5%, so H_0 is rejected and H_1 is accepted. This means that there is a significant influence between the management of facilities and infrastructure on the quality of education. The results of this study are supported by previous research, such as the research of Indahyani et. al (2021) shows the significant influence of facilities and infrastructure management on the quality of education. Good management includes planning, organizing, implementing and controlling facilities and infrastructure to ensure their suitability to the needs of the educational process (Hameed & A.Al-Salam, 2023; Hamka et al., 2023)

Planning for facilities and infrastructure resources in the cluster of 35 Lamreung Elementary Schools, Aceh Besar Regency was prepared at the beginning of the school year by involving all teachers with the development team and determining a priority scale according to the conditions required by each school. The plan is prepared in the form of planning, implementation and evaluation of previous planning. Every aspect is designed to improve educational facilities and infrastructure so that the learning and teaching process improves. Procurement of facilities and infrastructure resources in the cluster of 35 Lamreung Elementary Schools, Aceh Besar Regency, school principals who organize and are responsible for whatever is appropriate to be added to support the learning and teaching process. Procurement activities in the cluster of 35 Lamreung Elementary Schools in Aceh Besar district are: a) It has been submitted to BOS funds in each quarter of the annual budget. b) buying, granting or donating, renting, borrowing from other parties. c). Collect data and plan needs by the teacher council, students for needs in the time required. Utilization of facilities and infrastructure resources must be based on the use of school equipment and must be aimed at facilitating and also facilitating the achievement of educational goals at the school. The use of facilities and infrastructure resources must be supervised by the principal, deputy principal and all teachers in the school and the use of facilities and infrastructure must be regulated and given sanctions or fines to those who violate it. This is one way to prevent premature damage to facilities and infrastructure resources. Maintenance of facilities and infrastructure resources includes optimizing the useful life of all equipment so as to ensure the use of the equipment to

support the smooth running of work to produce good results. Maintenance carried out at cluster 35 of SDN Lamreung is carried out continuously and in stages to keep the school's equipment always in good condition for use. Maintenance is like cleaning buildings, tables, chairs, windows, glass. Apart from that, we also tidied up the office, library, classrooms and so on. Elimination of facilities and infrastructure resources in the 35 Lamreung Elementary School cluster is carried out by looking at goods or equipment for facilities and infrastructure that are no longer suitable for use or no longer function. Write-off is carried out if damaged equipment or goods cannot be repaired so that the budget can be increased and other facilities and infrastructure can be spent on resources.

Proper management is very important to create a conducive learning environment that supports academic and non-academic aspects of learning (Anthonysamy et al., 2020; Chaudhary, 2023; Pathoni Arzadi et al., 2021). Effective planning, organization and control of facilities is very important to optimize the learning process and improve educational outcomes (Hediansah & Surjono, 2020; Irmayani et al., 2018). Well-managed facilities contribute to increasing productivity and learning efficiency in educational (Solihin et al., 2020). Furthermore, implementing total quality management in facilities is necessary to meet the needs of students' learning processes and improve the overall quality of education (Razinkina et al., 2018). Management of adequate facilities and infrastructure ensures that educational goals are achieved and the learning process runs smoothly. Proper facility management is also important to maintain effective education and support the continuity of learning. Financial management strategies, including increasing funding sources and implementing quality improvement programs, are very important to support facilities and infrastructure to improve the quality of education (Komalasari et al., 2020). The use of educational facilities directly impacts the quality of teaching, thus emphasizing the importance of efficient use of facilities. Schools with inadequate physical facilities may face challenges in implementing the curriculum, leading to lower quality education and less competent graduates (Parveen & Tran, 2020).

Adequate infrastructure has a positive effect on the quality of education by providing important resources to support academic and non-academic aspects of learning (Ali & Sobri, 2023; Sihombing & Marpaung, 2023). Apart from that, management of facilities and infrastructure increases learning productivity in educational institutions (Komalasari et al., 2020). Well-organized planning is the key to encouraging a quality learning process. Adequate infrastructure can improve learning efficiency and education quality. Effective facilities management is essential to maintaining optimal education. Apart from physical facilities, financial management in the education sector, including funding sources and quality improvement initiatives, is crucial to strengthening facilities and infrastructure to improve the quality of education (Parveen & Tran, 2020; Rahnuma, 2020). The use of educational facilities has a direct impact on the quality of teaching, which underlines the importance of efficient use of facilities (Díez et al., 2020; Gorgoretti, 2019). In addition, the organization and management of teaching at the central and school levels is important to standardize educational activities and ensure proper use of educational infrastructure. Based on this description, it can be concluded that resource management of facilities and infrastructure has a positive impact on the quality of education.

CONCLUSION

The research results show that there is an influence of resource management of facilities and infrastructure on the quality of education as seen from the T test showing tcount 4,809 is greater than ttable 2,306 at a significance level of 5%. Optimizing facilities and infrastructure, including planning, procurement, utilization and maintenance, is the key to creating a conducive learning environment. In the cluster of 35 Lamreung Elementary Schools, planning for facilities and infrastructure involves all teachers and the development team, while procurement is regulated by the school principal through various sources. Utilization of facilities and infrastructure is supervised by the school principal and teacher council, with routine maintenance to ensure good condition and removal of items that are no longer suitable. Proper management creates a learning environment that supports academic and non-academic aspects, improves learning efficiency and educational quality, and ensures optimal use of educational infrastructure. The limitation of this research is that the participants included were too small. Therefore, for further research, it is hoped that research will be carried out involving a fairly large number of participants.

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