

Financial vs. Physical Resources: Comparing the Effects of Operational Budget Allocation and School Facility Adequacy on Student Learning Outcomes in Banyuasin Regency

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Abstract: This study aims to determine and analyze the influence of infrastructure and school operational assistance on the quality of learning at state elementary schools in Karang Agung Ilir District, Banyuasin Regency, both partially and simultaneously. A quantitative method with an ex post facto approach was employed, involving 91 teachers as the sample. Data were collected through questionnaires and documentation, with analysis conducted using the SPSS program. The findings conclude that: (1) infrastructure significantly influences learning quality; (2) school operational assistance significantly influences learning quality; and (3) simultaneously, both infrastructure and operational assistance exert a significant influence on learning quality at the state elementary schools in the district. This study offers empirical evidence from a less-accessible district context, demonstrating the combined explanatory power of physical resources and financial support on learning outcomes in an under-researched rural setting. Findings underscore the necessity for district policymakers to ensure equitable allocation of both infrastructure development funds and operational assistance to sustain and elevate learning quality, particularly in geographically challenged areas. This research contributes actionable insights for educational stakeholders, affirming that simultaneous investment in physical facilities and school operational funding is essential for optimizing learning quality. The results provide a foundational reference for resource distribution strategies aimed at narrowing inter-school quality gaps in similar rural Indonesian elementary education contexts.

Keywords: Elementary School, Quality of Learning, School Operational Assistance

A. Introduction

Education plays a strategic role in building national civilization, as stated in the preamble to the Constitution of the Republic of Indonesia, which mandates the intellectual development of the nation as a national ideal. To achieve this goal, the quality of learning is a fundamental indicator of educational success in schools, which is measured not only by student learning outcomes but also by the effective and meaningful learning process (Aditomo & Klieme, 2020). As an integral part of

educational quality, the quality of learning is strongly influenced by two main factors: the availability of infrastructure and the management of School Operational Assistance (BOS) (Romlah et al., 2023). Infrastructure is a vital component in creating a conducive learning environment, supporting teaching and learning activities, increasing teacher and student motivation, and developing talents and academic achievement through facilities such as representative classrooms, libraries, and adequate information technology.

The existence of adequate infrastructure enables teachers to deliver material effectively, students to better understand learning concepts through teaching media, and optimal interaction between teachers and students through the use of presentation technology and the internet (Akram et al., 2022; Bojović et al., 2020). This is in line with the provisions of the Minister of Education, Culture, Research, and Technology Regulation Number 22 of 2023, which stipulates the standards for facilities and infrastructure as the minimum criteria that must be owned by every educational unit, including furniture, educational equipment, learning media, books, consumables, and infrastructure in the form of classrooms, libraries, laboratories, teachers' rooms, sports facilities, and other supporting facilities. On the other hand, school operational assistance plays a crucial role in supporting the implementation of education, not only easing the economic burden on parents (Aminah et al., 2024), especially low-income families, but also supporting school operations, procurement of infrastructure, development of learning media, and improving the quality of teaching staff (Rahayu et al., 2025).

Regulations related to the management of BOS funds continue to be updated, as stated in the Minister of Education and Culture Regulation Number 8 of 2025, which regulates the use of Educational Unit Operational Assistance (BOSP) funds with a priority on strengthening literacy and numeracy through the procurement of books at a minimum of 10%, maintenance of infrastructure at a maximum of 20%, and allocation of honorariums adjusted to the status of the school. The ideal management of BOS funds follows the POAC (Planning, Organizing, Actuating, Controlling) principle as proposed by Hasibuan (2024), starting from the preparation of school activity plans and budgets, the formation of a management team, the implementation of priority programs, and periodic monitoring and evaluation to ensure the efficiency and accountability of school finances. Although various policies have been formulated to improve the quality of learning through the independent curriculum, which emphasizes essential materials, character development, and learning flexibility (Minister of Education, Culture, Research, and Technology Regulation No. 12 of 2024), the reality on the ground shows that many schools still face serious challenges in realizing optimal learning quality.

Based on the results of initial observations in 8 public elementary schools in Karang Agung Ilir District, Banyuasin Regency, involving 90 teachers, it was found that the infrastructure owned by each school was inadequate, indicated by the lack of learning

kits and textbooks; learning aids such as fractional blocks and flat and spatial models; as well as damage to physical infrastructure, including damaged classroom ceilings and floors, potholes and flooded fields, and student toilets that did not function optimally. This condition is exacerbated by the finding that the distribution of BOS funds in the region is not on target, where assistance that is conceptually intended for underprivileged students is actually given to students who are considered capable, and the use of school operational funds is not fully allocated for learning purposes such as repairing damaged infrastructure. As a result, the quality of learning at SDN Karang Agung Ilir District cannot be said to be optimal because the needs of the learning process have not been met and the management of BOS funds has not been effective and efficient.

This phenomenon shows a gap between the normative policies that have been set and implementation at the school level, as emphasized by Díez et al. (2020), who stated that the quality of learning is not only determined by teaching and learning activities in the classroom but is also influenced by school management, organizational culture, and the leadership of the principal in mobilizing all components of education. This research is important because it presents novelty in three aspects: first, the specific regional context in Karang Agung Ilir District, which until now has rarely been the object of empirical studies related to infrastructure and BOS simultaneously; second, the integration of infrastructure and school operational assistance variables in one analysis model to see the direct influence and relative contribution of each variable to the quality of learning, in contrast to previous studies that tend to examine it partially; third, the learning quality approach that is not only seen from the learning outcomes of students but also includes the learning process, the effectiveness of school management, and teacher performance, thus providing a comprehensive picture of the quality of learning at the public elementary school level. With this background, this study aims to empirically analyze the influence of infrastructure and school operational assistance on the quality of learning at SDN Karang Agung Ilir District, Banyuasin Regency, so that it is expected to contribute to the formulation of regional education policies that are more responsive to real needs in the field.

B. Methods

This research was conducted at Public Elementary Schools across Karang Agung Ilir District, Banyuasin Regency. The location was selected based on the consideration that the area has specific characteristics related to the condition of infrastructure and the management of school operational assistance funds, which still face various challenges in efforts to improve the quality of learning. The research is planned to last for six months, starting from December 2025 to May 2026. This time span is considered sufficient to carry out the entire series of research activities, from the preparation stage, data collection, and data processing to the preparation of the final research report. This research uses a quantitative approach. The quantitative method in this study is specified through an *ex post facto* approach. Through this approach,

researchers aim to identify causal factors that allow changes in behaviour, symptoms, or educational phenomena at a macro level by using statistical approaches such as correlation tests or linear regression to find causal relationships between phenomena precisely.

The fundamental reason for using an ex post facto approach is because this method is very much in line with the main focus of the study, namely analysing the influence of facilities and infrastructure and school operational assistance on the quality of learning at SDN Karang Agung Ilir District, Banyuasin Regency. Considering that the allocation of facilities and infrastructure and the distribution of school operational assistance funds are policies and programmes that have been implemented and directly felt by educational units, the evaluation of their impact on the quality of learning is considered most objective if dissected using an approach based on events that have occurred. The population in this study focused on all teachers actively serving in public elementary schools spread across the Karang Agung Ilir District, Banyuasin Regency. This subject selection is considered appropriate because educators are the parties who interact directly with facilities and infrastructure and feel the managerial impact of the management of school operational assistance funds.

The population in this study was 91 teachers. The sampling technique used in this study was purposive sampling. The primary criteria focused on those directly involved in the dynamics of learning quality in schools. While it is recognized that this technique carries a risk of bias and cannot always be freely generalized to a much larger population, this technique was chosen because it is considered efficient in collecting in-depth, specific, and targeted data for the analysis. Based on these criteria, the sample drawn in this study focused on educators (teachers) working in the relevant work area. Through the application of this purposive sampling technique, a final sample of 91 respondents was obtained, who were deemed to meet all research qualifications. Based on this framework, the data collection techniques applied in this study included a questionnaire and documentation.

In this study, the questionnaire was used as the primary data collection tool, structured on a Likert scale with four alternative answers reflecting the level of frequency of respondents' responses to the statements given. The use of the Likert scale aims to facilitate researchers in measuring respondents' attitudes, perceptions, and responses to the variables studied as explained by Sugiyono (2022). The questionnaire in this study was given to teaching staff at public elementary schools in the Karang Agung Ilir District, Banyuasin Regency, which became the research sample with a total of 91 teachers as respondents. The research instrument consisted of three types of questionnaires, namely a facilities and infrastructure questionnaire with 30 statement items, a school operational assistance questionnaire with 30 statement items, and a learning quality questionnaire with 30 statement items. All of these instruments were designed to obtain data related to the condition of facilities

and infrastructure, management of school operational assistance, and the quality of learning in the elementary schools that were the objects of research.

Documentation is a data collection technique used to obtain written information, such as documents, reports, archives, and various other written materials related to the research focus. In this study, documentation was used as supporting data, including questionnaire guidelines (questionnaires on facilities and infrastructure, school operational assistance, and learning quality), the results of the questionnaire or questionnaire instrument trials, the results of the actual research questionnaire distribution, and the results of the research data processing analysis using SPSS. All these documents were used to support the completeness of the research data, allowing for a more systematic and focused analysis process. They also served as evidence of the research implementation, strengthening the validity of the research results. In this study, a validity test was conducted to determine the appropriateness of the instrument used to measure the influence of school facilities and infrastructure and operational assistance on learning quality at SDN Karang Agung Ilir District, Banyuasin Regency.

The instrument trial was conducted on 20 randomly selected teachers outside the main research sample. The instruments tested consisted of three types of questionnaires, namely a 30-item infrastructure questionnaire, a 30-item school operational assistance questionnaire, and a 30-item learning quality questionnaire. The validity test aims to select statement items that truly correspond to the indicators and variables to be studied. The test was conducted by correlating the score of each statement item with the total score using Pearson correlation product-moment analysis. In this study, data processing was carried out using the SPSS 26 program and Microsoft Excel. Determining the validity of each instrument item was done by comparing the calculated r -value with the r -table value. Based on the r -product moment distribution table with a significance level of 5% and the number of respondents of 20 people, the r -table value was obtained = 0.444. If the calculated r -value $>$ r -table, then the statement item is declared valid, whereas if the calculated r -value $<$ r -table, then the item is declared invalid.

To test the internal consistency of the instrument, the researcher applied a statistical testing method in the form of Cronbach's alpha. Decision-making regarding the reliability of an instrument on a variable is done by comparing the obtained Cronbach's alpha value with the standard coefficient value of 0.6. Based on these methodological provisions, a research variable can be declared reliable if the resulting Cronbach's alpha value shows a number greater than 0.6 (> 0.6). Conversely, if the coefficient value found is below or equal to this limit, then the variable item is considered unreliable for use. The reliability testing process in the field was carried out by distributing the questionnaire once (single trial) to 30 respondents with similar characteristics but outside the core research sample. The data collected from the trial

results were then processed measurably using the SPSS program version 26 to obtain precise Cronbach's alpha coefficient values for each variable.

The data analysis techniques in this study used simple correlation and multiple regression analysis with the help of SPSS Version 26. The analysis stages included: (1) descriptive analysis, (2) analysis requirements testing, and (3) hypothesis testing. Hypothesis testing in this study used multiple linear regression analysis. This analysis was used to determine the partial effect of infrastructure on learning quality, the partial effect of school operational assistance on learning quality, and the simultaneous effect of infrastructure and school operational assistance on learning quality at SDN Karang Agung Ilir District, Banyuasin Regency. Multiple linear regression was chosen because this study involved two independent variables, infrastructure (X_1) and school operational assistance (X_2), and one dependent variable, learning quality (Y). The t-test was used to determine whether each independent variable had an individual effect on the dependent variable. The testing criteria for the t-test are as follows: the null hypothesis (H_0) is accepted if the 2-tailed significance value is greater than 0.05, and H_0 is rejected if the 2-tailed significance value is less than or equal to 0.05.

The simultaneous test (F-test) is conducted to determine the level of significance of the influence of the independent variables on the dependent variable simultaneously. The basis for decision-making in the F-test is based on comparing the calculated significance value with a significance level of 0.05. If the significance value is less than 0.05 ($\text{Sig} < 0.05$), the alternative hypothesis (H_a) is accepted and the null hypothesis (H_0) is rejected, indicating a simultaneous influence of school infrastructure and operational support on learning quality. Conversely, if the significance value is greater than 0.05 ($\text{Sig} > 0.05$), then the null hypothesis (H_0) is accepted and the alternative hypothesis (H_a) is rejected (Kesumawati and Aridanu, 2025). The Coefficient of Determination test was conducted to determine the closeness of the relationship between the independent variables of infrastructure (X_1), school operational assistance (X_2), and the dependent variable of learning quality (Y).

The coefficient of determination (R^2) essentially measures the model's ability to explain variation in the dependent variable. The coefficient of determination value is between zero and one. A small R^2 value indicates that the dependent variables have very limited ability, while a value close to one indicates that the independent variables provide almost all the information needed to predict variation in the dependent variable. To determine the coefficient of determination, researchers used the formula $Kd = R^2 \times 100\%$. The interpretation of the correlation coefficient between variables refers to Sugiyono's (2024) criteria, namely, 0.800-1.000 (very strong), 0.600-0.799 (strong), 0.400-0.599 (moderately strong), 0.200-0.399 (weak), and 0.00-0.199 (very weak).

The hypotheses proposed in this study are as follows:

Alternative Hypothesis (H_a):

1. H_{a1} : There is an influence of infrastructure on the quality of learning at SDN Karang Agung Ilir District, Banyuasin Regency.
2. H_{a2} : There is an influence of school operational assistance on the quality of learning at SDN Karang Agung Ilir District, Banyuasin Regency.
3. H_{a3} : There is a joint effect of infrastructure and school operational assistance on the quality of learning at SDN Karang Agung Ilir District, Banyuasin Regency.

Null Hypothesis (H_0):

1. H_{01} : There is no effect of infrastructure on the quality of learning at SDN Karang Agung Ilir District, Banyuasin Regency.
2. H_{02} : There is no effect of school operational assistance on the quality of learning at SDN Karang Agung Ilir District, Banyuasin Regency.
3. H_{03} : There is no joint effect of infrastructure and school operational assistance on the quality of learning at SDN Karang Agung Ilir District, Banyuasin Regency.

C. Results and Discussion

The results of this study indicate that each studied variable influences the quality of learning, both partially and simultaneously. Based on the analysis, it can be concluded that: (1) infrastructure influences the quality of learning at SDN Karang Agung Ilir District, Banyuasin Regency; (2) school operational assistance influences the quality of learning at SDN Karang Agung Ilir District, Banyuasin Regency; and (3) infrastructure and school operational assistance jointly influence the quality of learning at SDN Karang Agung Ilir District, Banyuasin Regency. These results indicate that the existence of adequate educational facilities and the effective management of school operational assistance play a crucial role in supporting the improvement of the quality of learning in elementary schools. Based on these findings, each research result will be discussed in further detail according to each studied variable to gain a deeper understanding of the interrelationships between the variables in this study.

Discussion of the Influence of Infrastructure on Learning Quality

Based on the first hypothesis testing stage using partial t-test statistical analysis, the researcher obtained an empirical picture of the significance of the influence of the first independent variable on the dependent variable. The data computation results show that the calculated t value for the successful infrastructure variable reached 6.062. This value is an important indicator for measuring the reliability of the prediction constant in the field. In the quantitative hypothesis testing criteria, decisions are made based on standard rules: if the calculated t value exceeds the t table value, then the Alternative Hypothesis (H_a) is declared accepted, whereas if the calculated t value is smaller than the t table, then H_a is automatically rejected.

To determine a precise t-table value as a comparative reference, the researcher referred to the 5% significance level parameter. Because this analysis employed a two-tailed test model, the allowance was halved to 2.5% (0.025) based on the calculation of degrees of freedom (df) using the $n - k$ formula. Given the sample size (n) in this study of 91 individuals and the number of independent variables in the partial test (k) of 2, the degrees of freedom obtained were $df = 91 - 2 = 89$. Referring to the t-distribution table with a significance level of 0.025 and 89 degrees of freedom, the definitive t-table value was obtained as 2.775. By comparing these two statistical parameter values, the researcher was able to formulate a highly valid methodological decision. Based on the data comparison, it is clear that the calculated t-value of 6.062 is significantly greater than the t-table value of 2.775 (calculated $t > t\text{-table}$). This empirical evidence provides a solid basis for conclusively rejecting the null hypothesis (H_0) and officially accepting the alternative hypothesis (H_a).

Thus, the results of this test provide scientific evidence that infrastructure has a significant partial effect on learning quality at SDN Karang Agung Ilir District, Banyuasin Regency. To complement this proof of significance, the analysis continued with model evaluation through a summary analysis of the coefficient of determination using a simple linear regression model. Based on the data processing results, the correlation coefficient, or R value, in the model summary was recorded at 0.541, indicating a fairly strong relationship between infrastructure and learning quality, as its value falls within the standardized range of 0.400 to 0.599. Meanwhile, the Standard Error of the Estimate of 0.18331 indicates the level of variation in the predicted values; the smaller this value, the more precise the regression model.

The quality of this model is enhanced by the acquisition of a coefficient of determination, R-squared (R^2), of 0.292, which means that the real contribution or influence of infrastructure on the quality of learning at SDN Karang Agung Ilir District, Banyuasin Regency, is 29.2%, while the remainder is influenced by other factors outside the focus of this study. Infrastructure is a vital supporter of learning quality because it creates a conducive learning environment, supports teaching and learning activities, enhances the enthusiasm for learning among both teachers and students, develops talents, and directly and indirectly influences academic achievement through facilities such as classrooms, libraries, and adequate technology, such as hotspots, to support effective learning processes. The availability of facilities and infrastructure in the educational ecosystem plays a crucial role in stimulating effective instructional processes (Mdodana-Zide & Chimbi, 2025; Nguyen et al., 2023).

Regarding the urgency of this issue, Pribadi (2023) explains that the primary function of facilities and infrastructure encompasses five crucial dimensions: creating student comfort while learning, fostering satisfaction and facilitating learning activities, accelerating the pace of the learning process, increasing academic productivity, and ensuring the quality of student outcomes. Furthermore, Daryanto (2023) states that all supporting facilities required by educational institutions are generally divided into

two main categories. The first is learning resources, positioned as direct tools for achieving educational goals, such as learning guides, stationery, notebooks, and learning media. The second is learning infrastructure, which acts as an indirect but fundamental component in supporting educational goals, manifesting in the form of classrooms, libraries, and laboratories. In line with this thinking, Vestfal & Seduikyte (2024) and Espinosa Andrade et al. (2024) also emphasized that school facilities and infrastructure are one of the most crucial supporting factors in determining the success of the teaching and learning process in the classroom.

However, achieving this ideal quality can only be achieved if the quantity and quality of facilities and infrastructure are adequate, balanced with an optimal governance system. Several essential facility components that require excellent management include conducive learning spaces, educational activity management rooms, prayer rooms, school health unit rooms, laboratories, counseling rooms, learning equipment storage, open fields to support extracurricular activities, and other operational support facilities. To strengthen the empirical position and scientific novelty of this study, the researchers conducted an in-depth review of several relevant previous studies. The first study examining this facility cluster was conducted by Yuseva et al. (2024) in a study entitled "The Influence of Principal Leadership and Facilities and Infrastructure on Teacher Performance." The study's results empirically conclude that principal leadership and infrastructure, both partially and simultaneously, have a positive and significant influence on the performance of state vocational high school teachers in Prabumulih City.

The functional relationship between that study and this study lies in the similarity in the independent variables that examine infrastructure aspects. However, a fundamental difference that separates these two studies lies in the focus of the accompanying independent variables and the dependent variables. The current researcher focused on the influence of infrastructure and school operational assistance on learning quality at an elementary school in Karang Agung Ilir District, Banyuasin Regency. This exploration of theoretical relevance is also strengthened by the findings of Wilarno and Mundilarno (2018) in their scientific publication entitled "The Influence of Infrastructure Utilization, Welfare, and Personality on Teacher Performance." The final conclusion of this research proves that infrastructure utilization, teacher welfare, and personality factors, both independently and together, have a significant influence on teacher performance at a state vocational high school in the Arts and Crafts Tourism Group in Yogyakarta City.

The point of intersection or relevance to this study is again demonstrated in the use of infrastructure variables as one of the primary stimuli in school organization. Meanwhile, the distinction that positions the originality of this research focuses on the research's focus, which is set at the public elementary school level, and the integration of an analytical model that links operational budget management to predicting learning quality outcomes in the field.

Discussion of the Effect of School Operational Assistance on Learning Quality

Based on the second hypothesis testing stage, the researcher conducted an in-depth analysis to determine the causal relationship between the school operational assistance variable (X₂) and learning quality (Y). Based on the simple linear regression coefficient estimates shown in the table above, the constant value (a) obtained was 1.050, while the regression coefficient for the school operational assistance variable (b) was 0.656. Based on these theoretical figures, the simple linear regression equation in this study can be formulated as:

$$\hat{Y} = 1.050 + 0.656 X^2$$

This mathematical equation implies that if the school operational assistance variable remains constant or unchanged, the learning quality level is predicted to be at a base score of 1.050. Meanwhile, the positive regression coefficient of 0.656 indicates that for every one-unit increase in the school operational assistance variable, the learning quality score is predicted to increase by 0.656 units at SDN Karang Agung Ilir District, Banyuasin Regency. To verify whether the effect indicated by the regression coefficient is partially significant, the researchers conducted a t-test at a 5% significance level. Because this analysis uses a two-tailed test model, the level of leeway was halved to 2.5% (0.025) based on the calculation of degrees of freedom (df) using the $n - k$ formula. Given that the sample size (n) in this study was 91 students and the number of variables in the partial test (k) was 2, the resulting degrees of freedom were $df = 91 - 2 = 89$, resulting in a t-table value of 3.396.

Based on the results of the field data comparison, it was found that the calculated t-value for the school operational assistance variable of 7.072 was proven to be much greater than the t-table value ($7.072 > 3.396$). This empirical fact provides a solid basis for deciding that the null hypothesis (H_0) is rejected and the alternative hypothesis (H_a) is accepted, which means that, partially, there is a significant influence of school operational assistance on the quality of learning. To complement the significance test, the level of inter-variable correlation was evaluated using the correlation coefficient (R) value listed in the model summary. The analysis showed an R value of 0.597, indicating that the school operational assistance variable has a fairly strong relationship with learning quality at SDN Karang Agung Ilir District, Banyuasin Regency. This correlation is categorized as moderately strong because the empirical correlation value falls within the standardization interval between 0.400 and 0.599.

Furthermore, the quality of this regression model is further strengthened by the Standard Error of the Estimate (standard deviation of the residual) value of 0.17474, where a smaller deviation indicates a better and more accurate level of model precision. At the end of the model summary analysis, attention is focused on the coefficient of determination to calculate the actual percentage contribution of the independent variables to the dependent variable. As presented in the data summary above, the calculation results demonstrate that the coefficient of determination (R^2)

achieved was 0.357. This coefficient theoretically indicates that the direct influence or contribution of school operational assistance on learning quality at SDN Karang Agung Ilir District, Banyuasin Regency, is 35.7%. Meanwhile, the remaining 64.3% of the variation is explained by supporting factors or other external variables outside the boundaries of this research model, such as the completeness of school infrastructure and teacher teaching competency.

To support the quality of learning in schools, School Operational Assistance is also essential. Without school operational assistance funds, the operational and learning processes at the school will not run optimally and effectively. School Operational Assistance, in addition to easing the burden on parents, also supports school operations and improves learning quality. The government regulation regarding the 2025 school operational assistance fund is Regulation of the Minister of Education and Culture Number 8 of 2025 concerning Technical Guidelines for the Management of Educational Unit Operational Assistance Funds. This regulation replaces previous regulations and regulates the distribution and use of funds, including priority for literacy and numeracy (minimum 10% for books), restrictions on facility maintenance (maximum 20%), and adjustments to honorarium allocations (maximum 20% for state schools and 40% for private schools).

The majority of school operational assistance funds must be used for activities that directly impact student learning. Furthermore, school operational assistance funds are used to maintain school facilities and infrastructure. As explained in Regulation of the Minister of Primary and Secondary Education Number 8 of 2025 concerning Technical Guidelines for the Management of Operational Assistance Funds for Educational Units, ensuring the right to access education through educational units requires operational support from educational units that can provide quality educational services for all. The role of the school operational assistance programme is not only to maintain student numbers but also to contribute to improving the quality of basic learning. Furthermore, the significant increase in school operational assistance funds since 2009 is expected to make school operational assistance a key pillar in realising free basic education, and consequently, the government is obligated to provide educational services to all students.

According to the Regulation of the Ministry of Education, Culture, Research, and Technology of the Republic of Indonesia Number 6 of 2021, school operational assistance is essentially a government programme designed to provide funding for the substantial operational costs of basic education units. This obligation is mandatory for implementing educational programmes. According to Minister of Education, Culture, Research, and Technology Regulation No. 63 of 2023, BOS funds are used to finance various school operational activities and are channelled directly to school accounts to avoid delays, expedite the process, and increase transparency. However, optimising BOS fund management remains a challenge that requires an effective management system. Research on School Operational Assistance (BOS), conducted by

Ronansyah (2023), concluded the following: 1) The structure of the BOS fund management team at SMK 11 Muarajo Jambi is based on a decree issued directly by the head of the school.

This decree serves as the basis for BOS fund management and is also a source of funds from the Jambi Provincial Education Office and the supervisory authority of SMK 11 Muarajo Jambi. The BOS fund management team at SMK 11 Muarajo Jambi consists of the head of the school, the deputy head of the school, the treasurer, and other internal school staff. At the beginning of the year, the BOS management team held a joint meeting to determine what needs would be prioritised to support the effectiveness of teaching and learning at SMK 11 Muarajo Jambi. 2) Obstacles that arise in the use of BOS funds: not all school needs can be funded from BOS funds, and there is a delay in disbursement of BOS funds. And there are also activities that must be carried out, but these activities are not registered in the archives. Plus, the number of students is not too many. 3) Solutions in overcoming obstacles in the use of BOS funds: to overcome funds spent by the school outside the use of BOS funds to carry out incidental activities, the school obtains funds to back up BOS funds that are not obtained from community donations. This study has similarities in examining school operational assistance with the research conducted by the researcher.

The difference is that this study examines the analysis of principal management in managing BOS funds on learning effectiveness at SMK 11 Muarajo Jambi, while the researcher conducted a study on the influence of facilities and infrastructure and school operational assistance on learning quality at SDN Karang Agung Ilir District, Banyuasin Regency. Another study on school operational assistance was conducted by Murniati (2019), who stated that 1) the principal has carried out his duties according to the mandate, where the distribution of school operational assistance funds to public junior high schools in Banda Aceh City has been on target; 2) the School Operational Assistance Fund is managed by a person appointed by the principal using the Microsoft Excel application program to facilitate the calculation of these funds; and 3) each allocation of funds used is integrated with the amount of assistance funds received, so it is easy to see and understand. This study has similarities in examining school operational assistance with the research conducted by the researcher.

The difference is that this study examines the principal's management in managing school operational assistance funds (BOS) at public junior high schools in Banda Aceh City, while the researcher conducted a study on the effect of facilities and infrastructure and school operational assistance on the quality of learning at SDN Karang Agung Ilir District, Banyuasin Regency. The research conducted by Hidayat et al. (2022) on school operational assistance explains the results of his research: 1) Funds are allocated realistically for the development of facilities (buildings, libraries) and infrastructure (teaching aids, technology) according to the priority needs of the school, involving the school committee and teachers; 2) Funds are used for

maintenance, repair, and procurement of learning tools, following the principles of flexibility, efficiency, effectiveness, accountability, and transparency; 3) Openness in financial management and reporting. This research has similarities in examining school operational assistance with the research conducted by the researcher. The difference is that this research examines the effectiveness of School Operational Assistance (BOS) fund management in improving educational facilities and infrastructure (Study at SDN 44 Mande, Bima City), while the researcher conducted a study on the influence of facilities, infrastructure, and school operational assistance on the quality of learning at SDN Karang Agung Ilir District, Banyuasin Regency.

Suandi's (2019) research, which examined school operational assistance, concluded the following results from his research: 1) Funds are used for the procurement of learning aids, library development, and teacher training, which directly support the teaching and learning process; 2) Repair and maintenance of school facilities (classrooms and toilets) help create a better learning environment. 3) In general, BOS funds have a positive and significant impact on improving the quality of education and learning achievement, especially when the management is effective and in accordance with regulations, but it needs to be balanced with increasing school capacity and the readiness of other supporting factors for maximum results. This research has similarities in examining school operational assistance with the research conducted by the researcher. The difference is that this research examines the effectiveness of using school operational assistance funds in improving learning achievement, while the researcher conducted a study on the effect of facilities and infrastructure and school operational assistance on the quality of learning at SDN Karang Agung Ilir District, Banyuasin Regency.

Discussion of the Impact of School Infrastructure and Operational Support

Learning quality is synonymous with the outputs optimally processed by educational institutions. It is from these outputs that the public can assess whether an educational institution is of high quality. Quality is considered high when it produces superior output and is able to compete with others. Improving learning quality is defined as a systematic, ongoing process to improve learning in schools and the factors related to it, with the goal of achieving school targets more effectively and efficiently. This means it will continue to evolve in line with current demands. Based on the Independent Curriculum for Elementary and Secondary Schools, as stipulated in Minister of Education, Culture, Research, and Technology Regulation No. 12 of 2024, the aim is to improve learning quality by focusing on essential materials, character development, and flexibility in lesson design. This allows teachers to provide deeper and more meaningful instruction while providing greater space for students to explore and develop their learning interests.

These challenges, along with the various problems that need to be addressed by educational institutions, serve as a driving force for improvement. Even without these,

schools need and must continue to improve their education/learning delivery to ensure the educational/learning process is increasingly satisfying for the communities they serve. Improving, developing, and enhancing the quality of school learning requires synergy from all stakeholders in school education to support its effective implementation. Developing education cannot be done by one party alone, nor can schools develop without the support of others. School organizations do not operate in isolation; they are part of the broader world of life, encompassing institutional, local, regional, national, and even global life today. According to Suharsaputra (2023), learning is indeed a primary concern in schools, as it is the reason for their existence. However, it is actually a reflection of how the school organization is designed, how the school culture is developed, how management is implemented, and how school leadership mobilizes all members of the organization.

Concurring with this theory, Baitanayeva et al. (2020) stated that the issue of learning quality in educational institutions is the most serious issue. On average, many educational institutions still fail to achieve quality learning. Yet, this quality learning is a shared goal of all educational thinkers and practitioners and has even been pursued through various means, methods, approaches, strategies, and policies. To achieve quality learning, as stipulated in the Minister of Education, Culture, Research, and Technology Regulation described above, it is also stated that the learning process in educational units is conducted interactively, inspiring, enjoyably, and challengingly, motivating students to actively participate and providing sufficient space for initiative, creativity, and abilities according to students' talents, interests, and physical and psychological development.

Therefore, careful consideration and planning are required to enhance student learning opportunities by improving the quality of teachers. This demonstrates that teachers are expected to play an active role in managing the teaching and learning process, acting as facilitators who consistently strive to create classroom organization, utilize teaching methods, and enhance teacher attitudes and characteristics in managing the teaching and learning process. Low learning quality can be caused by several factors, as Mulyasa (2022) explains, explaining seven main educational problems: declining student morals and ethics, equitable learning opportunities, low internal efficiency of the education system, institutional status, education management that is not aligned with national development, and unprofessional human resources.

Relevant research similar to the current study examining learning quality, such as that conducted by Wibowo et al. (2021), explains that the Ibnu Halim Education Foundation's Discipline Development program consistently prioritizes discipline for both students and teachers. The discipline was started by Mr. H. Fadli Ramadhan, S.Pd., M.Pd., who served as the head of the madrasah. Motivating teachers and encouragement from the head of the Ibnu Halim Education Foundation became the spirit for teachers to improve educational innovation as a concrete manifestation of

increasing teacher professional competence. Awards from the principal are the most important factor in improving performance productivity; through awards, teachers will improve their performance. Good perceptions are the most important factor in an organization; this principal needs to create a perception for each teacher towards his leadership so that teachers improve their performance. This study has similarities in examining the quality of learning with the research conducted by researchers.

The difference is that this study examines the improvement of learning quality at the Ibnu Halim Education Foundation, while researchers conducted research on the influence of facilities and infrastructure and school operational assistance on the quality of learning at SDN Karang Agung Ilir District, Banyuasin Regency. Another relevant study on learning quality was conducted by Sherly (2025), who explained that the driving teachers had a positive view of quality improvement programs, especially in terms of improving teaching skills and collaboration between teachers. However, there are challenges such as limited facilities and adequate policy support. The novelty of this study lies in an in-depth analysis of the role of driving teachers in elementary schools in the context of improving the quality of education in Palembang. The contribution of this study is expected to provide input for schools and policymakers in designing quality improvement programs that are more effective and appropriate to teacher needs and school conditions. This study has similarities in examining learning quality with the research conducted by the researcher. The difference is that this study examines the perceptions of driving teachers regarding improving the quality of learning, while the researcher conducted a study on the influence of school infrastructure and operational assistance on the quality of learning at SDN Karang Agung Ilir District, Banyuasin Regency.

D. Conclusion

Based on empirical data collected from 91 teacher respondents at SDN Karang Agung Ilir District, this study conclusively establishes that both infrastructure and school operational assistance (BOS) management exert positive and significant influences on learning quality, both partially and simultaneously. Partially, infrastructure encompassing facilities and learning media contributes 29.2% to the variation in learning quality, with a “quite strong” relationship, underscoring those adequate physical resources directly enhance instructional effectiveness. More dominantly, BOS management accounts for 35.7% of the variance, with a strong relationship, confirming that transparent, efficient, and accountable budget governance significantly drives quality improvements. Crucially, their simultaneous influence yields a combined contribution of 46.1%, with a strong relationship, proving that optimal learning quality emerges when material resources and financial governance are developed in tandem. The remaining 53.9% is influenced by factors outside this research model, indicating the need for broader contextual understanding. Practically, these findings mandate that school principals and school committees prioritize strategic infrastructure planning—ensuring that facilities and media are not only

available but also relevant, maintained, and utilized effectively in daily instruction. Simultaneously, BOS management must be strengthened through transparent planning, participatory budgeting, regular financial reporting, and community oversight to maximize its impact on learning. District education offices should provide technical guidance on infrastructure needs assessment and BOS accountability, while also allocating adequate funds for maintenance and procurement. Schools should establish routine evaluation mechanisms to monitor how infrastructure and budget utilization directly translate into classroom outcomes, ensuring that resource allocation aligns with pedagogical priorities. For future research, it is recommended to expand the investigation to include additional variables that account for the remaining 53.9% of variance such as teacher competence, principal leadership, school culture, or parental involvement to build a more comprehensive model of learning quality determinants. Comparative studies across multiple districts and school levels would enhance generalizability and reveal contextual variations. Longitudinal designs would track how changes in infrastructure and BOS management over time dynamically affect learning outcomes, while mixed-method approaches combining quantitative surveys with qualitative interviews or classroom observations could provide richer insights into the mechanisms through which resources translate into instructional quality. Finally, action research that involves stakeholders in co-designing infrastructure and budget interventions could generate contextually responsive solutions and foster local ownership of quality improvement initiatives.

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