

Enhancing School Effectiveness: The Impact of Principal Leadership, Infrastructure Utilization, and Administrative Services in Junior High Schools

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ABSTRACT

This study investigates the influence of principal leadership, infrastructure utilization, and administrative services on school effectiveness in public junior high schools in Tual City. Effective school management is essential for improving educational outcomes, particularly in regions where resources and leadership play a critical role in performance. The research involved 133 teachers and 318 students, selected through appropriate sampling techniques. Data were collected using a structured questionnaire covering four key variables: principal leadership, infrastructure use, administrative services, and school effectiveness. Data analysis was conducted using SPSS version 25, employing tests for normality, linearity, multicollinearity, and heteroscedasticity to ensure statistical validity. Findings revealed that principal leadership, infrastructure use, and administrative services were rated in the high category, with more than 86% of both teacher and student responses reflecting positive perceptions. Regression analysis showed a positive and significant combined effect of these three variables on school effectiveness, with results for teacher responses ($F = 5.122$, $sig. = 0.00$) and student responses ($F = 32.334$, $sig. = 0.00$) indicating strong statistical significance. These results emphasize the crucial role of leadership quality, efficient use of infrastructure, and strong administrative support in enhancing school effectiveness. The study underscores the need for targeted efforts in strengthening these areas to improve the overall quality of education in Tual City's junior high schools.

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1. INTRODUCTION

Education is seen as a solution in changing a better life (Novia & Asrizal, 2023; Rahm, 2023), which is sustainable to realize a better future according to Verhelst et al., (2021) by improving school effectiveness which is a priority for several countries around the world including in Indonesia (Hellström

& Hagquist 2021; Heryanto et al., 2023; Ismail et al., n.d.; Kawuryan et al., 2021). Therefore, schools must be adaptive and competitive, including in managing education in a systematic and planned manner to achieve school effectiveness and also strive to achieve its educational goals, function and utilize all school resources to the maximum to fulfill school effectiveness which has an impact on the quality of education that increases (Dwi et al., 2021).

School effectiveness is expressed as the extent to which the educational, organizational and administrative goals of the school are achieved (Chatzipanagiotou & Katsarou, 2023). There are several factors involved in the effectiveness of a school but it is generally said that school effectiveness is related to its efficiency and educational orientation (Ergin et al., 2021). It is said that school effectiveness is related to student learning outcomes (Sivri & Şahin, 2021) but in this study school effectiveness is associated with leadership factors in schools so that it will indirectly have an impact on school and student achievement.

Schools play an important role in moving society forward by providing quality education for the younger generation. The role of the principal as the main leader is crucial in realizing this goal. The principal is not only in charge of managing all components of the school, but is also responsible for creating a shared vision for the sustainable development of the school. Effective leadership will ensure that all resources and potential in the school are optimally utilized, thus supporting the achievement of better educational goals (Jaliah et al., 2020; Abrori & Muali, 2020). Therefore, competent principal leadership is essential to improve the quality of education in schools.

In addition to strong leadership, principals are also expected to have the ability to manage school, which includes making the right decisions and policies. These managerial capabilities will support the empowerment of all elements in the school, including teachers and administrative staff, to actively participate in achieving the school's vision and mission (Juharyanto et al., 2021; Farida et al., 2022). However, the main challenge often faced by school principals is the lack of knowledge and skills in management, which can hinder their leadership effectiveness (Hallinger & Heck, 2011). Principals who are able to overcome this obstacle through good management will be able to improve overall school effectiveness.

School effectiveness is strongly influenced by the organizational culture implemented by the principal (Chatzipanagiotou & Katsarou, 2023). A positive organizational culture will create an atmosphere conducive to learning and professional development for teachers and staff (Hellström & Hagquist, 2021; Saminathen et al., 2018). Principals who have a clear vision and provide appropriate direction will be able to build an organized and collaborative work structure, thus supporting the creation of a productive learning environment (Ramberg & Modin, 2019). With inspirational leadership, schools can achieve optimal results in accordance with the goals that have been set.

School facilities and infrastructure are also important factors in supporting the education process. The availability of adequate facilities, both in terms of quantity and quality, will support the teaching and learning process to be more effective and efficient (Özgenel, 2020; Tamajil, 2021). As part of educational administration, the management of facilities and infrastructure is the responsibility of the school principal to ensure that their use can optimally support the learning process at school (Attsaury et al., 2023; Nuswantoro et al., 2023; Sutarno, 2023). An imbalance in the quality or quantity of facilities and infrastructure can lead to a decline in the quality of education, especially if the available facilities do not meet students' learning needs.

In the context of education in Indonesia, educational disparities are often caused by geographical differences and the uneven availability of facilities (Huang et al., 2023). This can be seen in remote areas such as Maluku, where some areas still need special attention regarding educational facilities and infrastructure. Tual City, as one example in Maluku, has a significant education gap due to limited facilities and less than optimal administrative services (Warwefubun, 2021). Therefore, a comprehensive study is needed to map the needs of education facilities and infrastructure in this region. This study will assist policy makers in designing the right strategy to improve the quality of education in Tual City, in order to create equity and improve the quality of education.

Research shows that principal leadership, infrastructure management, and administrative services play a significant role in improving school effectiveness (Fikri & Lukman, 2018; Ningsih et al., 2022; Wiyono et al., 2023). Strong and effective leadership is proven to be able to empower all school potential, including maximizing the use of infrastructure to support the learning process. In addition, optimal administrative services provide the necessary support for teachers and students in achieving educational goals. The availability of adequate facilities and infrastructure, if managed well, also creates a conducive learning environment for all school members. The combination of professional leadership, efficient infrastructure management and responsive administrative services contributes significantly to school quality. However, further research is needed to explore the direct impact of principal leadership, infrastructure management and the quality of administrative services on school effectiveness, especially at the primary and secondary education levels.

2. METHODS

2.1 Research Type

This study uses a descriptive quantitative type with a survey method, which is designed to analyze the influence between the independent variables, namely principal leadership, use of infrastructure facilities, and administrative services, on the dependent variable, namely school effectiveness. The data collected is then presented in the form of numbers and analyzed using statistics. This quantitative approach was chosen to measure the extent of the influence of the principal's leadership, the use of infrastructure facilities, and administrative services on school effectiveness in several State Junior High Schools in Tual City.

2.2 Location and Sample of Research

This research was conducted at the State Junior High School (SMP) in Tual City, with the research period lasting from January to February 2024. The population used in this study consisted of teachers and students of public junior high schools in Tual City, which were adjusted to the variables or question instruments asked of the research subjects. The total population consisted of 202 teachers and 1,822 students, spread across several schools. The sampling technique in this research was stratified sampling, taking into account the strata of the population and other elements. Based on the table provided, the number of teachers and students in each school is as follows: SMP Negeri 1 Tual has 60 teachers and 675 students, SMP Negeri 2 Tual has 60 teachers and 462 students, SMP Negeri 3 Tual has 20 teachers and 112 students, SMP Negeri 7 Tual has 44 teachers and 442 students, and SMP Al Hilal Tual has 18 teachers and 131 students.

2.3 Research Variabel and Operational Definition

This study uses two main types of variables, namely independent variables and dependent variables. The independent variables in this study include Principal Leadership (X1), Use of Infrastructure (X2), and Administrative Services (X3). Meanwhile, the dependent variable is School Effectiveness (Y), which is the result or impact of the influence of the independent variables.

The operational definition of variables is needed to avoid differences in understanding of the terms in this study. School Effectiveness (Y) is defined as the school's ability to utilize resources to achieve goals effectively and efficiently, measured through indicators such as clear goal formulation, strong leadership, conducive climate, and good internal performance (Amri et al., 2020; Wati et al., 2022). Principal Leadership (X1) is the ability of the principal to direct and motivate staff to achieve educational goals, with indicators as educator, leader, manager, innovator, administrator, supervisor, and motivator (Sudrajat, 2023; Mulyasa, 2003). Infrastructure Use (X2) includes the completeness, availability, and quality of educational facilities that support the learning process (Hidayati & Dzuroidah, 2020; Saputri et al., 2023). Administrative Services (X3) is the process of controlling work in

educational institutions, with service quality indicators including physical evidence, reliability, responsiveness, assurance, and empathy (Adawiah et al., 2022).

2.4 Data Collection Technique and Instruments

This study used data collection techniques through questionnaires, in which instruments of questions and statements were given to respondents to get answers. The questionnaire aimed to collect data and information about the principal's leadership, the use of infrastructure, administrative services, and school effectiveness. The respondents involved were teachers and students of public junior high schools in Tual City. Documentation techniques were also applied to ensure the accuracy of data obtained in the field, such as collecting data on the number of teachers and education report cards.

This study used data collection instruments in the form of questionnaires designed to measure the variables of principal leadership, use of infrastructure, administrative services, and school effectiveness. The questionnaire was developed based on indicators of each variable, using a Likert scale consisting of positive and negative statements. To ensure the validity and reliability of the instrument, the validity test was conducted by involving expert lecturers as validators, who provided input for improvement. After validation, the questionnaire was tested on 30 teachers and students at public junior high schools in Tual City. The results of the analysis showed that most of the items were valid and reliable, so the instruments used were considered appropriate for collecting data in this study.

2.5 Data Analysis Techniques

Data analysis is carried out after data collection from all respondents is complete, aims to answer the formulation of research problems and give meaning to the data that has been collected (Sugiyono, 2018). The analysis process includes grouping data based on variables and types of respondents, tabulating data, and presenting analysis results which include average, median, mode, standard deviation, and range. In quantitative research, data analysis also serves to test hypotheses. Testing is done manually and through software such as Excel and SPSS. Simple and multiple linear regressions were used to analyze the influence between variables. Descriptive analysis was used to describe the data of the research variables, while prerequisite tests such as normality, linearity, multicollinearity, and heteroscedasticity ensured the data met the requirements for regression analysis. Simple and multiple linear regressions are used to measure the effect of the independent variable on the dependent variable, as well as to determine the coefficient of determination which shows how much influence the independent variable has on the dependent variable. Simultaneous significance tests were conducted with F statistics to test the joint influence of independent variables, while effective and relative contributions measured the contribution of each variable to the regression model.

3. FINDINGS AND DISCUSSION

3.1 Descriptive Statistic

The principal leadership variable (X1) was measured using a questionnaire consisting of 27 items of questions and statements. To determine the number of interval classes, the formula number of classes = $1 + 3.3 \log n$ is used. The calculation result for teacher respondents is 8.009, while for student respondents is 9.258. Furthermore, the data range is calculated by the formula maximum score - minimum score + 1. The result for teacher respondents is $108 - 85 + 1 = 24$, while for student respondents is $108 - 80 + 1 = 29$. To determine the class length, the formula range divided by the number of classes is used. As a result, the teacher respondents obtained $24/8 = 3$, while the student respondents obtained $29/9 = 3.22$.

Table 1. Frequency Distribution of Principal Leadership Variables (Teacher)

No.	Interval	Frequency	Percentages
1.	85-87	5	3.76%
2.	88-90	6	4.51%
3.	91-93	15	11.28%
4.	94-96	21	15.79%
5.	97-99	29	21.80%
6.	100-102	23	17.29%
7.	103-105	20	15.04%
8.	106-108	14	10.53%
	Total	133	100%

Source: Data by Researcher

The category of each indicator is in the high category. The highest indicator category on the principal leadership variable of teacher respondents is on indicator number 1, namely the educator indicator of 94.42%, while the lowest indicator is on indicator number 5, namely the leader indicator of 88.53%.

Table 2. Categories per Indicator of Principal Leadership Variable (teacher)

No.	Indicator	Total Score	Criterion Score	Percentage	Category
1.	Educator	3014	3192	94.42%	High
2.	Manager	1489	1596	93.30%	High
3.	Administrator	1936	2128	90.98%	High
4.	Supervisor	1431	1596	89.66%	High
5.	Leader	1413	1596	88.53%	High
6.	Inovator	1896	2128	89.10%	High
7.	Motivator	2898	3232	89.57%	High

Source: Data by Researcher

The frequency and percentage distribution table shows that of the total 318 respondents, the majority were in the 95-97 score interval with 67 respondents (21.07%), reflecting good performance. The second highest frequency is in the 92-94 interval, with 58 respondents (18.24%). In contrast, only 4 respondents (1.26%) were in the lowest score interval of 80-82, while the highest score (107-109) was only achieved by 10 respondents (3.14%). Overall, while there were a number of individuals who achieved very high scores, most respondents showed positive results in the lower score ranges, with significant decreases in the higher intervals.

Table 3. Frequency Distribution of Principal Leadership Variables (student)

No.	Interval	Frequency	Percentages
1.	80-82	4	1.26%
2.	83-85	9	2.83%
3.	86-88	25	7.86%
4.	89-91	36	11.32%
5.	92-94	58	18.24%
6.	95-97	67	21.07%
7.	98-100	51	16.04%
8.	101-103	40	12.58%
9.	104-106	18	5.66%
10.	107-109	10	3.14%
	Total	318	100%

Source: Data by Researcher

The category of each indicator is in the high category. The highest indicator category on the principal leadership variable for student respondents is indicator number 6, namely the innovator indicator of 90.21%, while the lowest indicator is indicator number 2, namely the manager indicator of 86.71%.

Table 4. Categories per Indicator of Principal Leadership Variable (student)

No.	Indicator	Total Score	Criterion Score	Percentage	Category
1.	Educator	6796	7632	89.05%	High
2.	Manager	3309	3816	86.71%	High
3.	Administrator	4422	5088	86.91%	High
4.	Supervisor	3368	3816	88.26%	High
5.	Leader	3391	3816	88.865	High
6.	Inovator	4590	5088	90.21%	High
7.	Motivator	4539	5088	89.21%	High

Source: Data by Researcher

The variable use of infrastructure (X2) was measured using a questionnaire consisting of 27 items of questions and statements for teacher respondents, and 26 items for student respondents. To determine the number of interval classes, the formula number of classes = $1 + 3.3 \log n$ is used. The calculation results show that for teacher respondents, the number of classes is 8.009, while for student respondents it is 9.258. Furthermore, the data range was calculated using the formula maximum score minus minimum score plus 1, so the results obtained for teacher respondents were $104 - 82 + 1 = 23$, and for student respondents were $104 - 80 + 1 = 25$. To determine the class length, a calculation was made by dividing the range by the number of classes, so the results obtained were $23/8 = 2.87$ for teacher respondents and $25/9 = 2.77$ for student respondents.

The category of each indicator is in the high category. The highest indicator category on the variable use of student respondents' infrastructure facilities is in indicator number 1, namely the completeness of infrastructure facilities indicator of 94.79% while the lowest indicator is in indicator number 3, namely the quality of infrastructure facilities indicator of 87.89%.

Table 5. Frequency Distribution of Infrastructure Use Variables

No.	Interval	Frequency	Percentage
Teacher Respondents			
1.	82-84	6	4.51%
2.	85-87	15	11.28%
3.	88-90	19	14.29%
4.	91-93	32	24.06%
5.	94-96	26	19.55%
6.	97-99	17	12.78%
7.	100-102	13	9.77%
8.	103-105	5	3.76%
	Total	133	100%
Student Respondents			
1.	80-82	4	1.26%
2.	83-85	14	4.4%
3.	86-88	38	11.95%
4.	89-91	57	17.92%
5.	92-94	81	25.47%
6.	95-97	58	18.24%

7.	98-100	42	13.21%
8.	101-103	20	6.29%
9.	104-106	4	1.26%
	Total	318	100%

Source: Data by Researcher

The category of each indicator is in the high category. The highest indicator category on the variable use of infrastructure facilities for teacher respondents is in indicator number 1, namely the indicator of the completeness of the use of infrastructure facilities at 94.47%, while the lowest indicator is in indicator number 3, namely the indicator of the quality of the use of infrastructure facilities at 82.78%.

Frequency and percentage distribution of a variable grouped in score intervals, with a total of 318 respondents. The highest score interval is found in the 92-94 range, where 81 respondents (25.47%) are located, indicating that most respondents have scores in this range. The next interval, 89-91, included 57 respondents (17.92%), while the 95-97 interval had 58 respondents (18.24%), indicating that many respondents also scored above average. In contrast, the intervals with the lowest frequency were 80-82 and 104-106, each with only 4 respondents (1.26%). Overall, the results show that the majority of respondents tend to score between 89 to 94, reflecting good performance or understanding in the measured context.

Table 6. Categories per Indicator Variable Use of Infrastructure Facilities

No.	Indicator	Total Score	Criterion Score	Percentage	Category
Teacher Respondents					
1.	Completeness of infrastructure	2513	2660	94.47%	High
2.	Availability of infrastructure	4148	4788	86.63%	High
3.	Quality of infrastructure	2202	2660	82.78%	High
4.	State or condition of infrastructure	3535	4256	83.06%	High
Student Respondents					
No.	Indicator	Total Score	Criterion Score	Percentage	Category
1.	Completeness of infrastructure	4823	5088	94.79%	High
2.	Availability of infrastructure	9137	10176	89.79%	High
3.	Quality of infrastructure	5590	6360	87.89%	High
4.	State or condition of infrastructure	10101	11448	88.23%	High

Source: Data by Researcher

The administrative service variable (X3) was measured using a questionnaire consisting of 30 question items and statements for teacher respondents, and 29 items for student respondents. To determine the number of interval classes, the formula number of classes = $1 + 3.3 \log n$ is used. The calculation results show that the number of classes for teacher respondents is 8.009, while for student respondents it is 9.258. Furthermore, the data range was calculated by the formula maximum score minus minimum score plus 1, so the results obtained for teacher respondents were $120 - 94 + 1 = 27$ and for student respondents $120 - 94 + 1 = 27$. To determine the length of the class, the formula range divided

by the number of classes was used, so the results obtained for teacher respondents were $27/8 = 3.37$ and for student respondents were $27/9 = 3.00$.

Frequency and percentage distribution of a variable grouped in value intervals. Out of a total of 318 respondents, the 105-107 interval has the highest frequency with 69 respondents, which means 21.70% of the total. Next, the 102-104 interval was followed by 59 respondents (18.55%) and the 108-110 interval by 61 respondents (19.18%). Meanwhile, the interval 99-101 includes 40 respondents (12.58%), and the interval 114-116 has 24 respondents (7.55%). The 93-95 and 96-98 intervals had only 9 (2.83%) and 19 (5.97%) respondents respectively. Overall, this distribution shows that the majority of respondents have scores that fall between 105 and 110, reflecting relatively good performance in the context being measured.

Table 7. Frequency Distribution of Administrative Service Variables

No.	Interval	Frequency	Percentage
Teacher Respondents			
1.	94-96	6	4.51%
2.	97-99	12	9.02%
3.	100-102	18	13.53%
4.	103-105	24	18.05%
5.	106-108	33	24.81%
6.	109-111	17	12.78%
7.	112-114	9	6.77%
8.	115-117	10	7.52%
9.	118-120	4	3.01%
	Total	133	100%
Student Respondents			
No.	Interval	Frequency	Percentage
1.	93-95	9	2.83%
2.	96-98	19	5.97%
3.	99-101	40	12.58%
4.	102-104	59	18.55%
5.	105-107	69	21.70%
6.	108-110	61	19.18%
7.	111-113	37	11.64%
8.	114-116	24	7.55%

Source: Data by Researcher

The category of each indicator is in the high category. The highest indicator category in the administrative service variable for teacher respondents is indicator number 1, namely the administrative service responsiveness indicator of 94.86%, while the lowest indicator is indicator number 4, namely the administrative service empathy indicator of 84.74%.

The category of each indicator is in the high category. The highest indicator category in the administrative service variable for student respondents is indicator number 1, namely the administrative service responsiveness indicator of 94.10%, while the lowest indicator is indicator number 4, namely the administrative service empathy indicator of 89.58%.

Table 8. Categories Per Indicator of Administrative Service Variables

No.	Indicator	Total Score	Criterion Score	Percentage	Category
Teacher Respondents					
1.	Administrative service responsiveness	3028	3192	94.86%	High
2.	Reliability of administrative services	3769	4256	88.56%	High
3.	Guaranteed administrative services	2771	3192	86.81%	High
4.	Empathy of administrative services	2254	2660	84.74%	High
5.	Physical evidence of administrative services	2297	2660	86.35%	High
Student Respondents					
1.	Administrative service responsiveness	7182	7632	94.10%	High
2.	Reliability of administrative services	9317	10176	91.56%	High
3.	Guaranteed administrative services	6842	7632	89.65%	High
4.	Empathy of administrative services	4558	5088	89.58%	High
5.	Physical evidence of administrative services	5736	6360	90.19%	High

Source: Data by Researcher

The school effectiveness variable (Y) was measured using a questionnaire consisting of 28 question items and statements for teacher respondents, and 26 question items and statements for student respondents. To determine the number of interval classes, the formula number of classes = $1 + 3.3 \log n$ was used, resulting in a value of 3.009 for teacher respondents and 9.258 for student respondents. Furthermore, the data range was calculated by the formula maximum score - minimum score + 1, resulting in a value of $109 - 87 + 1 = 23$ for teacher respondents and $104 - 81 + 1 = 24$ for student respondents. Calculations were made using the formula range divided by the number of classes to find out the length of the class, resulting in $23/8 = 2.87$ for teacher respondents and $24/9 = 2.66$ for student respondents.

The frequency and percentage distribution of the data are grouped in score intervals. Out of a total of 318 respondents, the 90-92 interval has the highest frequency with 86 respondents, which equates to 27.04% of the total. The 96-98 interval followed with 57 respondents (17.92%), and the 93-95 interval had 51 respondents (16.04%). In contrast, the 81-83 interval has the lowest frequency with only 7 respondents (2.20%). Overall, the data shows that the majority of respondents are in the higher value intervals, with the greatest concentration between 90 to 92. This indicates relatively good performance among respondents in the measured context.

Table 9. Frequency Distribution of School Effectiveness Variables

No.	Interval	Frequency	Percentage
Teacher Respondents			
1.	87-89	4	3.01%
2.	90-92	10	7.52%
3.	93-95	22	16.54%
4.	96-98	26	19.55%
5.	99-101	33	24.81%
6.	102-104	25	18.80%
7.	105-107	10	7.52%
8.	108-110	3	2.26%
	Total	133	100%
Student Respondents			
1.	81-83	7	2.20%
2.	84-86	17	5.35%
3.	87-89	31	9.75%
4.	90-92	86	27.04%
5.	93-95	51	16.04%
6.	96-98	57	17.92%
7.	99-101	45	14.15%
8.	102-104	24	7.55%
	Total	318	100%

Source: Data by Researcher

All indicators of the school effectiveness variable fall within the high category for both teacher and student respondents. Among teacher responses, the highest-rated indicator is Indicator 1: "School strategy is formulated appropriately," with a score of 93.91%. The lowest-rated is Indicator 3: "Internal performance," at 85.77%.

Similarly, student responses also place all indicators in the high category. The highest-rated indicator is again Indicator 1: School strategy formulation, with a slightly higher score of 95.03%, while the lowest is Indicator 3: Internal performance, rated at 87.98%.

These findings indicate a consistently strong perception of school effectiveness, particularly in terms of strategic planning, while also highlighting areas—such as internal performance—that may benefit from further attention and improvement.

Table 10. Categories per Indicator of School Effectiveness Variable

No.	Indicator	Total Score	Criterion Score	Percentage	Category
Teacher Respondents					
1.	School strategy is formulated appropriately	2498	2660	93.91%	High
2.	Principal's role	2802	3192	87.78%	High
3.	Internal Performance	3194	3724	85.77%	High
4.	School Environment	4618	5320	86.80%	High
Student Respondents					
1.	School strategy is formulated appropriately	4835	5088	95.03%	High
2.	Principal's role	7094	7632	92.95%	High
3.	Internal Performance	8953	10176	87.98%	High
4.	School Environment	9064	10176	89.07%	High

Source: Data by Researcher

3.2 Prerequisite Tests

3.2.1 Normality Test

Principal leadership (X1) is 0.200, use of facilities and infrastructure (X2) is 0.200, administrative services (X3) is 0.080 and school effectiveness (Y) is 0.200 where Asymp. Sig. (2-tailed) > 0.05, it can be concluded that variables X1, X2, X3 and Y are normal. It can be concluded that the data is normally distributed.

Table 11. Results of Normality Test Analysis (teacher)

		X1	X2	X3	Y
	N	133	133	133	133
Normal	98.38	93.22	106.16	98.59	99.00
Parameters ^{a,b}	5.551	5.164	5.717	4.705	4.771
Most Extreme	.058	.058	.073	.069	.061
Differences	.042	.058	.073	.053	.047
	-.058	-.041	-.059	-.069	-.061
Test Statistic		.058	.058	.073	.069
Asymp. Sig. (2-tailed)		0.200	0.200	0.080	0.200

Source: Data by Researcher

Principal leadership (X1) is 0.089, use of facilities and infrastructure (X2) is 0.071, administrative services (X3) is 0.064, and school effectiveness (Y) is 0.074 where Asymp. Sig. (2-tailed) > 0.05, it can be concluded that variables X1, X2, X3 and Y are normal. It can be concluded that the data is normally distributed.

Table 12. Results of Normality Test Analysis (student)

		X1	X2	X3	Y
	N	318	318	318	318
Normal Parameters ^{a,b}	Mean	95.64	93.24	105.77	94.17
	Std.	5.780	4.873	5.247	5.041
	Deviation				
Most Extreme Differences	Absolute	.047	.048	.049	.048
	Positive	.038	.048	.044	.042
	Negative	-.047	-.046	-.049	-.048
Test Statistic		.047	.048	.049	.048
Asymp. Sig. (2-tailed)		0.089	0.071	0.064	0.074

Source: Data by Researcher

3.2.2 Linearity Test

A linearity test was conducted to determine the relationship between several independent variables with the dependent variable of school effectiveness. Based on the results of the data analysis presented in the table, several linearity tests have been conducted to assess the linear relationship of these variables. The linearity test shows that the variables of Principal Leadership, Use of Facilities and Infrastructure, and Administrative Services each have a linear relationship with School Effectiveness, with significance values of Deviation from Linearity of 0.184, 0.328, and 0.369, all of which are greater than 0.05.

The linearity test shows that the variables of Principal Leadership, Use of Facilities and Infrastructure, and Administrative Services each have a linear relationship with School Effectiveness. For the variable of Principal Leadership on School Effectiveness, the significance value of Deviation from Linearity of 0.350 indicates linearity. In the variable of Use of Facilities and Infrastructure, the significance value of 0.077 is also greater than 0.05, thus indicating a linear relationship. Finally, in the

variable of Administrative Services on School Effectiveness, the significance value of 0.061 confirms the existence of a linear relationship.

Table 13. Results of the Linearity Tests for X1, X2, and X3 Against Y

No.	Relationship Variable	F Calculated	Sig	Description
Teacher Respondents				
1	X1 with Y	1.306	0.184	Linear
2	X2 with Y	1.131	0.328	Linear
3	X3 with Y	1.088	0.369	Linear
Student Respondents				
1	X1 with Y	1.090	0.350	Linear
2	X2 with Y	1.476	0.077	Linear
3	X3 with Y	1.537	0.061	Linear

Source: Data by Researcher

3.2.3 Multicollinearity Test

In the multicollinearity test on teacher respondents, the tolerance value for principal leadership is 0.990, the use of infrastructure is 0.962, and administrative services is 0.970, all greater than 0.1. In addition, the VIF value for principal leadership is 1.010, the use of infrastructure is 1.039, and administrative services is 1.031. All are less than 10. Thus, it can be concluded that there is no multicollinearity between the independent variables.

In the multicollinearity test on student respondents, Tolerance value for principal leadership is 0.976, use of infrastructure is 0.983, and administrative services is 0.993, all are greater than 0.1. VIF values for principal leadership are 1.024, use of infrastructure is 1.017, and administrative services are 1.007, which are all less than 10. So, it can be concluded that there is no multicollinearity symptom between independent variables.

Table 14. Results of the Linearity Tests for X1, X2, and X3 Against Y

No	Variable	VIF	Description
Teacher Respondents			
1	X1	1.010	No multicollinearity detected
2	X2	1.039	No multicollinearity detected
3	X3	1.031	No multicollinearity detected
Student Respondents			
1	X1	0.976	No multicollinearity detected
2	X2	0.983	No multicollinearity detected
3	X3	0.993	No multicollinearity detected

Source: Data by Researcher

3.2.4 Heteroscedasticity Test

The heteroscedasticity test is used to test whether there is an inequality of the residuals' variance for all regression model observations. The significance value of variable X1 is 0.387, X2 is 0.202 and X3 is 0.842. The results of the heteroscedasticity test indicate that the significance value is > 0.05 . The significance value of variable X1 is 0.062, X2 is 0.124, and X3 is 0.620. The results of the heteroscedasticity test indicate that the significance value is > 0.05 , so it can be concluded that there is no heteroscedasticity in this study.

3.3. Hypothesis Test

Principal leadership has a significant positive impact on school effectiveness. Every 1% increase in principal leadership will increase school effectiveness by 14.7%, assuming the variables of infrastructure use and administrative services remain constant. In addition, a 1% increase in infrastructure use also contributes to an increase in school effectiveness, which is 16.9%, while a 1% increase in administrative services has a positive effect of 17.3%.

Thus, all of these variables show a positive direction of influence on school effectiveness. Overall, the coefficient values of each variable confirm that an increase in principal leadership, infrastructure use, and administrative services significantly supports school effectiveness. With a coefficient value of principal leadership of 0.147, infrastructure use of 0.169, and administrative services of 0.173, it is clear that each aspect plays an important role in improving school performance. This shows that development efforts in these three areas will have a positive impact on the overall effectiveness of educational institutions.

3.4 Relative Contribution and Effective Contribution

Principal leadership provides an effective contribution of 2.8% and a relative contribution of 0.20%, the use of facilities and infrastructure provides an effective contribution of 5.8% and a relative contribution of 0.41% and administrative services provide an effective contribution of 5.6% and a relative contribution of 0.40%. Together, the variables of principal leadership, use of facilities and infrastructure and administrative services provide an effective contribution of 14.1% to school effectiveness.

Principal leadership provides an effective contribution of 5.69% and a relative contribution of 0.24%, the use of facilities and infrastructure provides an effective contribution of 16.14% and a relative contribution of 0.68% and administrative services provide an effective contribution of 1.79% and a relative contribution of 0.08%. Together, the variables of principal leadership, use of facilities and infrastructure and administrative services provide an effective contribution of 23.6% to school effectiveness.

Table 15. Results of Calculation of Effective Contribution and Relative Contribution of Independent Variables to Dependent Variables

Variable	Correlation Coefficient	Regression Coefficient (Beta)	R ²	SE	SR
Teacher Respondents					
X1	0.203	0.137	14.1	2.8	0.20
X2	0.267	0.217		5.8	0.41
X3	0.261	0.213		5.6	0.40
Student respondents					
X1	0.271	0.210	23.6%	5.69	0.24
X2	0.416	0.388		16.14	0.68
X3	0.144	0.124		1.79	0.08
Total	23.6	1.0			
Total				14.1	1.0

Source: Data by Researcher

The size of the contribution given by the principal's leadership, as well as the use of facilities, infrastructure, and administrative services, are positively related to school effectiveness. Good principal leadership, the use of adequate facilities and infrastructure, and improved administrative services support the success of increasing school effectiveness.

Based on the results of the analysis, it is explained that the principal's leadership, the use of facilities and infrastructure and administrative services together provide a positive contribution that is quite basic to school effectiveness. Good principal leadership, the appropriate use of facilities and

infrastructure, and the optimal use of administrative services will support increasing school effectiveness. Overall, the results of the hypothesis test on the research variables show a respondent relationship model, which can be seen in the following picture.

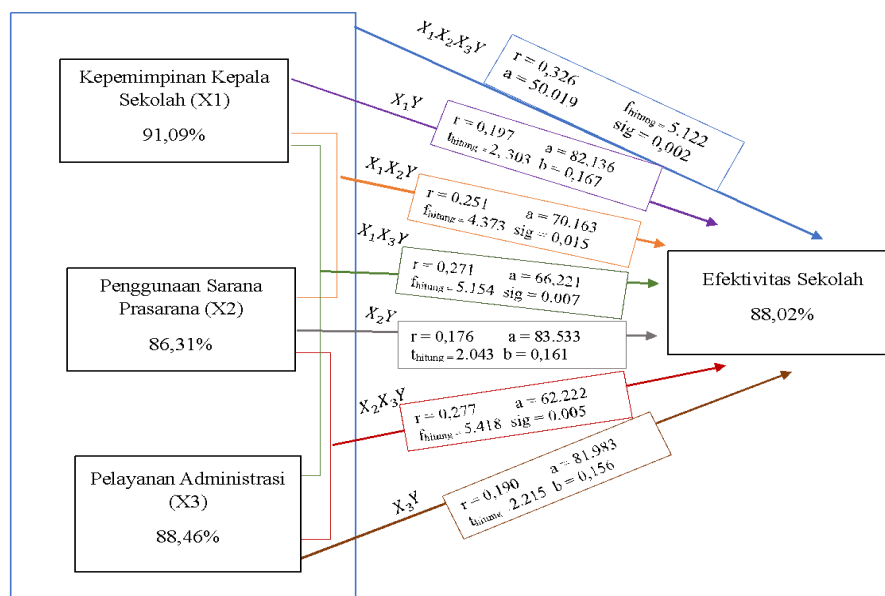


Figure 1. Research Relationship Model (teacher)

Source: Data by Researcher

From the diagram, it can be reinforced that the three factors—school leadership, utilization of facilities, and administrative services—significantly contribute to school effectiveness. Effective school leadership stands out as the primary factor with the highest contribution (91.09%), underscoring the importance of leadership in creating a conducive and competitive educational environment. A school principal with strong managerial skills can positively influence other organizational aspects, such as the optimal use of facilities and efficient administrative services, thereby enhancing overall effectiveness (Wiyono et al., 2023a).

Furthermore, although school leadership has the largest contribution, the roles of facilities utilization and administrative services cannot be overlooked. Optimal use of facilities and efficient administrative services show significant impacts on school effectiveness, with respective contribution rates of 86.31% and 88.46%. This emphasizes that school effectiveness results from the synergy of various organizational aspects, where improvement in one area can strengthen the others. By addressing these three factors in a balanced manner, schools can achieve optimal and sustainable effectiveness, creating a positive impact on the learning environment and students’ achievements (Guo et al., 2023).

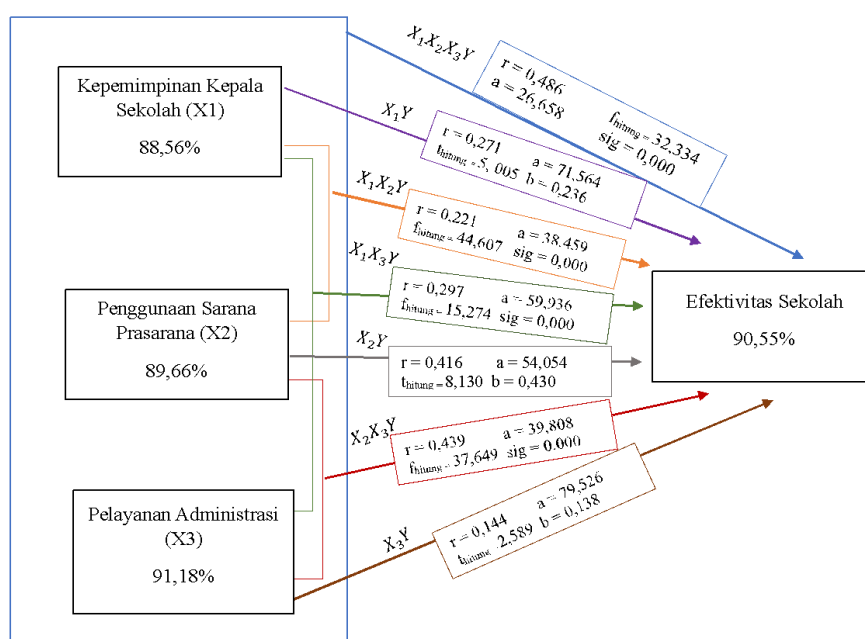


Figure 2. Research Relationship Model (student)

Source: Data by Researcher

The diagram highlights the significant influence of school leadership, facilities utilization, and administrative services on school effectiveness, with varying levels of impact from each factor. School leadership (X1) contributes 88.56% to effectiveness, emphasizing the critical role of effective leadership in achieving organizational goals and maintaining a conducive environment for learning. School leaders who exercise strong managerial and interpersonal skills can facilitate better coordination across departments, enhancing the quality of education and overall school performance.

In addition to leadership, facilities utilization (X2) and administrative services (X3) also play substantial roles, contributing 89.66% and 91.18%, respectively, to school effectiveness. The high percentages indicate that proper resource management and efficient administrative operations are essential to sustaining school effectiveness. Effective use of facilities supports teaching and learning processes, while streamlined administrative services reduce delays and improve service delivery. Together, these factors create a synergistic effect that enhances school effectiveness, fostering a positive impact on the school community and student outcomes.

This study aims to determine the influence of principal leadership, use of facilities and infrastructure and administrative services on school effectiveness. The relationship model between independent variables and dependent variables in this study influences each other, which is known from the results of the research analysis, which indicates that the size of the contribution given by the principal's leadership, use of facilities and infrastructure and administrative services together are positively related to school effectiveness. The results of the analysis in this study are divided into two, namely from the perspective of teachers and students where the results of the study are different for teacher respondents, the principal's leadership variable has a greater influence on school effectiveness, which is 91.09%, while for student respondents, the administrative service variable has the highest influence on school effectiveness of 91.18%.

The innovation in this study is by raising new variables, namely administrative services and also testing carried out on independent variables together with dependent variables that are still minimal, literature reviews, this is also a novelty in this study, especially in the place where the research was carried out. The results of the determination coefficient test, both partially and simultaneously on teacher and student respondents, showed values above 0.05. Thus, it can be concluded that increasing

school effectiveness can be achieved by improving indicators on the variables of principal leadership, use of facilities and infrastructure and administrative services.

4. CONCLUSION

This study concludes that enhancing school effectiveness in junior high schools can be significantly achieved by improving three key variables: principal leadership, the use of facilities and infrastructure, and administrative services. Effective principal leadership encompasses multiple roles, including those of educator, manager, administrator, supervisor, leader, innovator, and motivator—each contributing to a well-functioning school environment. Similarly, optimal use of school facilities and infrastructure depends on their completeness, availability, quality, and condition, which directly influence teaching and learning processes. Administrative services play a crucial role and can be strengthened through dimensions such as reliability, responsiveness, assurance, empathy, and the tangible quality of service delivery.

However, this study is limited by its scope and methodology, particularly the reliance on quantitative data and the specific context of public junior high schools in one city. These limitations may restrict the generalizability of the findings to other educational levels or regions.

Future research should consider employing mixed-methods approaches to gain deeper insights into how these variables interact and influence school effectiveness from multiple stakeholder perspectives. Expanding the study to include diverse school types, regions, and qualitative data—such as interviews or focus groups—could offer a more comprehensive understanding. Longitudinal studies are also recommended to explore the sustained impact of leadership, infrastructure, and administrative improvements on student outcomes over time.

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