

The Contribution of School Leadership to the Improvement of Science Management and Education Quality in Elementary Schools in Balaraja-Tangerang

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Abstract: This study aims to analyze and evaluate the contribution of school leadership to the improvement of science management and education quality in several elementary schools located in Balaraja, Tangerang. The research uses a qualitative approach with a case study method. Data collection is carried out through in-depth interviews, participatory observation, and the analysis of documents relevant to school management practices and the implementation of school leadership. The study's respondents include the school head, teachers, administrative staff, and some parents to obtain a more comprehensive perspective on the effectiveness of the leadership applied in the schools. The research findings show that school heads who implement a transformational leadership style have been successful in creating a more conducive school climate for teaching and learning. This leadership style encourages active participation from teachers and staff in the decision-making process, which impacts an increased sense of responsibility and commitment to improving education quality. The school head also plays a significant role in ensuring that teachers receive regular training and professional development, ultimately improving their teaching competencies. Additionally, the study also finds that good school management, directly influenced by the school head's leadership, has a significant impact on students' academic achievements. School heads who are able to facilitate curriculum updates and innovations in teaching methods have contributed to this success. Technology-based development programs and improvements in educational facilities have also proven to increase student engagement in the learning process, which leads to improved academic performance.

Keywords: Environmental awareness; IPAS; Project-based learning; Sustainable Development Goals.

Introduction

The leadership of the school principal plays a crucial role in improving the quality of education, especially at the elementary school level (Siregar, 2024; Supriyono et al., 2021). The principal is not only an administrator but also a leader responsible for managing all aspects of school management, including teacher performance, the quality of learning, and student

development. In the current era of globalization, the challenges in the education sector are becoming increasingly complex, requiring school principals to have innovative and adaptive leadership skills. At Al Itqon Elementary School in Balaraja, Tangerang, the leadership of the principal plays an important role in supporting effective and sustainable management, which directly impacts the improvement of education quality (Agustina & Niron, 2025; Yani et al., 2024).

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According to research conducted by Meyer et al. (2022), leadership in schools is not only about how a principal manages administrative activities, but also about how they can create a collaborative work environment, innovate, and support the professional development of teachers and staff. An effective school principal must be able to motivate and guide all members of the school in achieving common goals, especially when facing changes and challenges in the education world (Allolangi & Kurniati, 2023).

In the context of Indonesian education, Mulyasa (2022) emphasizes that the school principal is the key to the success of improving education quality. A competent principal must be able to play the roles of manager, leader, and developer of human resources within the school. Furthermore, good school leadership will encourage the improvement of the quality of learning by involving teachers in decision-making processes and supporting the development of their professionalism.

A study by Bush & Glover (2016) from abroad also shows that strong school leadership is strongly correlated with improved school effectiveness. They argue that a principal must have a clear vision for the direction of the school and must be able to empower staff to work towards that vision. This requires good managerial skills, where the principal is able to allocate resources efficiently, facilitate collaboration among teachers, and develop programs that support the improvement of student learning outcomes.

Additionally, Hallinger & Heck (2010) highlight the importance of transformational leadership style in school management. They argue that transformational leadership allows school principals to motivate teachers and staff to achieve higher performance by building trust, empowering staff, and creating an inspirational work environment. At Al Itqon Elementary School, such leadership styles are highly relevant to implement, considering the challenges faced in improving the quality of education amid resource limitations and the need for innovation in teaching.

A study by Robinson & Timperley (2007) the direct influence of school leadership on student learning outcomes. According to them, effective school principals are those who are directly involved in improving the quality of teaching by facilitating teacher development through training, mentoring, and continuous evaluation. In this regard, the principal not only plays a role as an administrator but also as a pedagogical leader focused on improving student academic achievement.

In Indonesia, a study by Hadiyanto et al. (2021) highlights the role of the school principal in improving school management through the use of information technology. According to the study, principals who can utilize technology to support administration and

learning in schools will create a more effective and efficient learning environment. This is highly relevant to the developments at Al Itqon Elementary School, where the use of technology in school management can support the overall improvement of education quality.

A more recent study by Leithwood & Sun (2018) examines the role of school leadership in creating a conducive school climate for learning. According to their research, a positive school climate, shaped by effective school leadership, directly contributes to improved student performance. A principal who can create a supportive work culture, recognize outstanding teachers, and involve parents and the community in school activities will be able to significantly enhance the quality of education (Marlyna et al., 2025).

On the other hand, a study conducted by Yusoff et al. (2023) in Malaysia emphasizes that result-oriented school leadership is crucial in developing effective school-based management. They argue that school principals must have skills in strategic planning, evaluation, and decision-making to ensure that all aspects of school management align with achieving educational goals. Al Itqon Elementary School, as an institution focused on character development and academic achievement, requires a principal with a long-term vision and the ability to manage resources efficiently.

Furthermore, research by Harris et al. (2017) reveals that inclusive leadership is essential in creating a diverse and inclusive school environment. A principal who understands and values diversity within the school will be able to foster a more democratic environment and encourage active participation from the entire school community. This is increasingly relevant in schools with diverse socioeconomic backgrounds, such as Al Itqon Elementary School in Balaraja.

Based on various expert perspectives, it can be concluded that school leadership plays a significant role in improving management and education quality. At Al Itqon Elementary School in Balaraja-Tangerang, an effective principal must implement leadership focused on transformation, innovation, and active participation from all school members. This will not only improve school management but also have a direct impact on the quality of teaching and student learning outcomes (Mariani & Suyud, 2024). To meet the increasingly complex challenges in education, school principals need to continuously develop adaptive, innovative, and results-oriented leadership skills to achieve better educational quality.

Method

The data for this study will be collected through several techniques: In-Depth Interviews, interviews will be conducted with the principal, several teachers, and administrative staff to gather their perspectives on the implementation of transformational leadership and its impact on school performance (Hendrowati et al., 2025). Interviews with parents and students will also be conducted to obtain additional insights on the changes they have observed at the school; Participant Observation, the researcher will conduct direct observations of daily activities and interactions at the school. This observation aims to see how the principal applies the principles of transformational leadership in real-life situations, as well as how teachers and students respond to it; and documentation, the researcher will also collect and analyze various relevant documents, such as school performance reports, meeting minutes, and internal communication records, to support the data obtained through interviews and observations.

Result and Discussion

Based on the 2024 Education Report Card of SDS Al Itqon, which contains information about the condition of services in the educational unit, measured through various indicators present in the Education Report Card.

Achievement Literacy Skills

Based on the results of interviews, observations, and documentation, the following data was found: The percentage of students based on their ability to understand, use, reflect on, and evaluate various types of texts (informational and fictional texts) shows that their achievement level is categorized as good, at 83.33%. This indicates that the students have met the expected competencies (Asmarany et al., 2024). The majority of students have reached the minimum competency level for reading literacy. Compared to the previous year, there was an increase of 20% in achievement, bringing the students into the upper middle rank (21-40%).

Based on the literacy test results, students were categorized into three levels: Basic Level: 40% of students (ability to understand simple sentences and identify the main idea); Intermediate Level: 45% of students (ability to draw conclusions from texts and identify key details); and Advanced Level: 15% of students (ability to analyze and critically evaluate the content of texts)

Factors Affecting Reading Literacy

Family Support: Students with family support (e.g., reading together with parents) show higher levels

of literacy (Fatmawaty, 2023). Availability of Reading Materials: Schools with well-equipped libraries tend to have better average literacy scores compared to schools with limited access to reading materials; Teaching Methods: Students who engage in discussion-based and problem-solving learning methods tend to have better literacy skills. Interviews with students and teachers revealed that students feel more motivated to read when the reading topics are relevant to their daily lives. Teachers who provide positive feedback also play a key role in boosting students' confidence in reading (Raja et al., 2025).

Achievement Numeracy Skills

Based on the results of interviews, observations, and documentation, the following data was found: The percentage of students based on their ability to think using concepts, procedures, facts, and mathematical tools to solve everyday problems in various relevant contexts is at a moderate level, with 66.67% of students meeting the minimum competency. Between 40% and 70% of students have reached the minimum competency for numeracy, but there is a need to encourage more students to achieve the minimum competency. Compared to the previous year, the achievement has decreased by 3.3%.

Number Domain Competency Description

The number domain includes the ability to understand, operate, and apply number concepts in various contexts. This competency covers integers, fractions, decimals, as well as comparisons and ratios.

Students generally have a good understanding of basic operations (addition, subtraction, multiplication, and division). However, difficulties were found in: operations with fractions and decimals and applying the concept of ratios in contextual situations. Contextual practice is needed to enhance understanding of ratio concepts and operations with fractions (Fitrianiingrum & Murtiyasa, 2023).

Algebra Domain

This domain includes the ability to recognize patterns, understand relationships between variables, and solve equations and inequalities. Students are able to solve simple equations and understand the concept of variables. However, challenges were observed in: Solving complex inequalities and applying algebraic patterns in non-routine situations. It is recommended to use a problem-based approach that encourages in-depth exploration of patterns and relationships between variables.

Geometry Domain

The geometry domain includes the recognition of shapes, measurement of length, area, volume, and understanding spatial relationships. Students demonstrate a strong basic understanding of recognizing geometric shapes and calculating area and volume. However, there are gaps in: Understanding the

concept of geometric transformations (rotation, translation, reflection); Interpreting spatial relationships in two- and three-dimensional problems. Learning based on visual and manipulative media can help students better understand geometric transformations and spatial relationships (Simarmata et al., 2024).

Table 1. Education report card of SDS AL ITQON

Indicator	Achievement label 2024	Achievement scores 2024	Definition of achievement	Changes in Achievement Values	Achievement 2023
Achievement Literacy: The percentage of students based on their ability to understand, use, reflect on, and evaluate various types of texts (informational texts and fiction texts).	Good (83.33% of students have reached the minimum competency)	83.33%	Most students have reached the minimum competency threshold for reading literacy	Increase 20.00%	63.33%
Achievement Numeracy. The percentage of students based on their ability to think using concepts, procedures, facts, and mathematical tools to solve everyday problems in various relevant contexts	Moderate (66.67% of students have reached the minimum competency)	66.67%	40% - 70% of students have achieved the minimum competency in numeracy, but efforts are needed to encourage more students to reach the minimum competency	Decreased by 3.33%	70.00%
Character. The average character score of students based on values of ethics towards others, ethics towards the environment, ethics in citizenship, mutual cooperation, creativity, critical thinking, global diversity, and independence in the character survey	Good	54.45%	Students are accustomed to applying the values of Pancasila student character, including noble ethics, mutual cooperation, independence, creativity, critical thinking, and global diversity in their daily lives	Increased 2.83%	51.62%
Learning Quality. The average score for learning quality includes classroom management, psychological support, and	Good	65.01%	Teaching demonstrates optimal quality, as shown by a conducive classroom atmosphere,	Increase 3.42%	61.59%

Indicator	Achievement label 2024	Achievement scores 2024	Definition of achievement	Changes in Achievement Values	Achievement 2023
teaching methods in the learning environment survey			affective support, and constructive cognitive activation from the teacher		
Reflection and Improvement of Teaching by Teachers. The average score related to the level of reflection and improvement of teaching by teachers based on the learning environment survey	Good	59.24%	The teacher actively improves the quality of teaching after reflecting on past lessons, exploring new teaching references, and innovating to create lessons that stimulate student engagement	Increase 2.34%	56.90%

Data and Uncertainty Domain

This domain includes the ability to collect, organize, analyze, and interpret data, as well as understanding basic probability concepts. Students are able to read and interpret simple data from tables and graphs. However, there are barriers in: Drawing conclusions from complex data; Understanding basic probability concepts. Practice in the form of case studies involving real-world data, as well as simple probability simulations, can enhance students' understanding in this domain (Islamiyati et al., 2021). Students generally have a good understanding of basic operations (addition, subtraction, multiplication, and division). However, there are difficulties in: Operations with fractions and decimals. Applying the concept of ratios in contextual situations.

Overall, students have basic numeracy competencies across all domains. However, to improve learning outcomes, there is a need for reinforcement in real-world applications and solving complex problems. A problem-based approach, the use of interactive learning media, and contextual practice problems are recommended as strategic steps.

Character

Based on the results of interviews, observations, and documentation, the following data was found: The average character score of students based on values of ethics towards others, ethics towards the environment, ethics in citizenship, mutual cooperation, creativity, critical thinking, global diversity, and independence in the character survey. Students are accustomed to applying the values of Pancasila student character, including noble ethics, mutual cooperation, independence, creativity, critical thinking, and global diversity in their daily lives (Irawan et al., 2023; Parwati

& Suastra, 2024). Last year, the percentage was 54.45%, showing an increase of 2.83% from the previous year.

Analysis of Student Character Competencies Based on Character Survey

This research aims to analyze students' character competencies based on values of ethics and other character competencies, including ethics towards humans, nature, the state, cooperation, creativity, critical thinking, global diversity, and independence (Tyas et al., 2020). Below are the results of the analysis based on these domains: This domain refers to attitudes of respect, empathy, and fairness in relationships among individuals. Students show a high level of empathy towards their peers and teachers. However, challenges remain in practicing fairness, particularly in group work. Some students tend to dominate or fail to appreciate the opinions of others. Discussion-based learning and conflict simulation activities are necessary to raise awareness about the importance of fairness.

Ethics Towards Nature

This refers to the attitude of caring for and being responsible towards the environment. Students generally have a basic awareness of the importance of maintaining cleanliness. However, actual implementation in daily activities like recycling and resource conservation is still low. Action-based programs such as environmental campaigns and recycling projects can strengthen pro-environmental behavior (Hsieh, 2025).

Ethics Towards the State

This involves awareness of rights and responsibilities as citizens and a love for the country. Awareness of the values of Pancasila and the

constitution is already instilled. However, active participation in state-related activities, such as flag ceremonies or competitions related to nationalism, still needs to be increased. Strengthening extracurricular activities with a nationalistic theme can enhance students' patriotism (Wastl-Walter, 2012).

Cooperation (Gotong Royong)

This refers to working together in a group to achieve common goals. Students can cooperate well in small groups, particularly in practical assignments. However, coordination in larger groups still faces challenges, particularly in ensuring equal task distribution. Community-based project simulations on a larger scale can help develop this skill (Williams et al., 1999).

Creativity

The ability to generate new ideas and innovative solutions in various situations. Students demonstrate good ability in creating artistic works and innovative solutions in projects. However, creativity in academic contexts (such as solving math problems in unconventional ways) still needs improvement. Providing open-ended assignments that allow exploration of various solutions can encourage academic creativity.

Critical Thinking

Involves the ability to analyze information logically and make decisions based on valid data. Students have basic problem-solving skills that require logical thinking. However, there are still difficulties in evaluating sources of information and distinguishing facts from opinions. Enhancing critical thinking through debate exercises and article analysis can hone students' ability to think critically.

Global Diversity

Understanding, appreciating, and practicing the values of diversity in a global context. Students show respect for local cultural diversity. However, their understanding of global issues, such as climate change and international human rights, remains limited. Enriching material through discussions on global issues and cultural exchange programs can broaden students' perspectives on global diversity.

Independence

The ability to take responsibility for the learning process and outcomes independently. Most students can manage their study time well. However, some still require guidance in identifying learning goals and evaluating their progress. Mentoring programs and the

use of learning portfolios can help students improve their independence. The research shows that students have a strong foundation in various aspects of character. However, there is room for development, especially in terms of real-life application and global awareness. Experience-based learning programs, value reinforcement through school activities, and integrating character values into subject lessons can further optimize the development of students' character.

Learning Quality

Based on the results of interviews, observations, and documentation, the following data was found: The average score for learning quality includes classroom management, psychological support, and teaching methods in the learning environment survey. Teaching demonstrates optimal quality, as shown by a conducive classroom atmosphere, affective support, and constructive cognitive activation from the teacher. The score is 65.01%, an increase of 3.42% from the previous year. The research results show that the quality of learning in the school has a solid foundation, particularly in creating a structured and emotionally supportive learning environment. However, there is a need to improve several aspects, especially in more dynamic classroom management, more targeted psychological support, and innovative teaching methods. Measures such as teacher training, strengthening the role of counseling services, and enhancing learning facilities can help improve the overall quality of learning.

Reflection and Improvement of Teaching by Teachers

Based on the results of interviews, observations, and documentation, the following data was found: The average score related to the level of reflection and improvement of teaching by teachers based on the learning environment survey. Teachers actively improve the quality of teaching after reflecting on past lessons, exploring new teaching references, and innovating to create lessons that stimulate student engagement. The score is 58.24%, an increase of 2.34% from the previous year.

Conclusion

The school leadership plays a significant role in enhancing both the science management and the quality of education in elementary schools. The findings of the study revealed several key points as follows: The Role of the Principal as an Instructional Leader. The principal plays a crucial role in designing and implementing effective learning strategies. Visionary leadership can motivate teachers to enhance their competencies and

creativity in the teaching and learning process. Efficient Resource Management. An effective principal can optimize human resources, school facilities, and budgets. Good management creates a conducive learning environment, which supports the improvement of students' academic achievements. Improving Education Quality through Teacher Professional Development. The principal encourages regular teacher training and professional development. This improves the pedagogical skills and professionalism of teachers, which directly contributes to enhancing the quality of education. Participatory and Collaborative Leadership Principals who practice participatory leadership involve all stakeholders, including teachers, staff, students, and parents, in decision-making processes. This approach creates a shared sense of responsibility to achieve educational goals.

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