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Increasing the Principal's Leadership in Student Achievement in the Science Learning at Sebatik Vocational School

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Abstract: This research aims to identify and analyze efforts to improve the principal's leadership in student achievement in science learning at Sebatik Vocational School using a qualitative approach. The problem of limited laboratory facilities and science equipment is the main focus in this research. The data analysis method is based on qualitative data analysis techniques developed by Miles and Huberman. There were 4 respondents in this study, namely, school principals, teachers and students. Data collection techniques through interviews, observation and documentation. The results of this research found that efforts to improve school principal leadership include advocacy for budget allocations, initiatives to expand access to teaching materials, and close communication between stakeholders. The hope is to improve responsive and inclusive leadership strategies in the quality of science learning at Sebatik Vocational School and improve student achievement in science subjects.

Keywords: Principal leadership; Science learning; Student achievement

Introduction

Education is an important aspect for a country to be able to compete internationally. Education is also an important need for countries like Indonesia (Christopoulos et al., 2023). In this case, education is one of the government's concerns in improving the quality of Human Resources (HR) so they can compete effectively (Azizah et al., 2023). Improving the Quality of Human Resources (HR) has challenges for the Indonesian nation, namely the quality of education (Usman, 2020). Efforts to improve the quality of education can be made by seeking various improvements to the curriculum, Human Resources (HR), facilities and infrastructure (Harum et al., 2022). Through quality education, quality human resources will be created (Arif et al., 2024). When discussing the quality of education, it cannot be separated from the role of quality, professional and dignified teachers and school principals (Tresnawati et al., 2024).

The principal's leadership is an important factor in determining school success (Simatupang et al., 2023). Leadership is behavior with a specific purpose to influence the activities of group members to achieve common goals designed to provide individual and organizational benefits (Rivai, 2014). Leadership is the activity of influencing people so that they want to work together to achieve desired goals (Amini et al., 2021). Leadership is the ability to influence a group towards achieving goals (Fahmi, 2014). Based on several expert opinions above, it can be concluded that leadership is the ability to influence, direct the behavior of subordinates or other people to achieve organizational or group goals (Akmar et al., 2024).

The principal's leadership is a series of efforts to improve a school's goals in the quality of education, therefore the principal as the driving force and determiner of policy direction and has great responsibility for the success achieved by the school and also as the principal must also be responsible for planning, organizing, directing, coordinating,

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supervising and evaluating activities in the school (Sudrajat, 2023). In line with this opinion, working together and showing good behavior can form a successful leader, because the spirit of group work is in leadership (Zaini, 2021).

Good leadership patterns can motivate teachers and students to achieve goals, but poor leadership can cause stagnation and low student learning outcomes (Muliartini et al., 2019). This problem often arises and occurs in the leadership of school principals, including lack of effective communication, lack of decision making (Betan et al., 2023). The right decision for all school employees, and low motivation of teachers and students (Zulfah, 2023). This problem has an impact on the welfare and educational goals of the school (Damayanti et al., 2021).

In practice, the principal's leadership has a positive and significant effect on student learning achievement and the teacher's professional attitude has a positive and significant effect on student learning achievement (Fauzi et al., 2024). This means that the better the principal's leadership results in higher student learning achievement and the higher the influence of the teacher's professional attitude results in higher student learning achievement (Widiyatmoko et al., 2024). Thus, the principal's leadership and teacher professionalism are very important because they have a very positive influence on student learning achievement (Barseli et al., 2019).

Achievement is the success of students in achieving the goals that have been planned and exist in the program that has been set (Mashuri & Wahyudiati, 2023). Achievement is the achievement of students by carrying out learning every semester to determine the level of student learning progress or achievement (Manurung, 2017). Siagian (2015) have another opinion regarding achievement, which is a measurement of learning levels related to the learning process or learning progress using established methods and curricula (Irwandi et al., 2024). Learning achievement is something achieved by students through experience or practice and also from the level of talent possessed by students (Alfaizin & Hakim, 2023). Lelariana (2022) explains that learning achievement is an achievement that has been achieved by students after carrying out the learning process in progressing student achievement.

According to Safithry et al. (2020) Learning achievement is the potential or knowing the capacity that students have in learning. According to Irawan (2023) explains that learning achievement is the result of student success or shows the student's ability to carry out learning at school and carry out activities according to the weight they have achieved (Sulasdi & Ismarwati, 2023). From the statement above, it can be concluded that learning achievement is a success achieved by students and the measurement is based on report cards with high accumulated scores and can be used as a form of student learning success.

In a preliminary study at Sebatik Vocational School, it was found that students' learning achievement had problems with science learning conditions. Limited conditions in the availability of laboratory facilities and completeness of science equipment. This creates obstacles in implementing an interactive, practice-based learning process for students (Betan et al., 2023). This problem is caused by, among other things, limited budgets for updating equipment and lack of access to relevant teaching materials which can hinder an effective learning process (Barata & Kayser, 2023). Therefore, appropriate strategies are needed to overcome these challenges in order to improve the quality of science learning (Wulur & Mandagi, 2023).

In this problem, the leadership role of the school principal must have a high level of responsibility because in a school, whether good or bad, the quality of the school is the principal who holds full power (Khofifah & Banin, 2023). High commitment is needed by a school principal in improving the development of the quality of education and has high power over the good and bad of the school inside the school and outside the school, because the principal not only has high power but also as a stakeholder in the educational staff and school teaching staff have standards (Setiawati et al., 2022). Standards that must be achieved, and high quality performance (Alfiyansah et al., 2023). The school principal must have a high commitment to carrying out school leadership in order to create good quality to improve learning achievement for students (Evicasari, 2021). So from the statement above, the school principal is expected to be able to maintain the quality of education or programs in the school so that what is expected and what has been planned can be implemented well (Kartika & Tjakrawiralaksana, 2021).

From the problems obtained by researchers in the field, they are trying to analyze how efforts to improve the leadership of the principal at Sebatik Vocational School affect student achievement in learning Sciences. As the main leader in the educational environment, the principal has a very important role in creating a conducive learning environment and motivating students and teachers (Alfiyansah et al., 2023). With effective leadership, school principals can direct existing resources to overcome challenges in science learning, such as limited facilities and resources.

Method

This data collection method uses a qualitative approach with a phenomenological method. Creswell (2015) states that phenomenological research aims to

understand in depth the lived experiences of individuals or groups related to a particular phenomenon or event. In the context of this research on improving the principal's leadership in student achievement in science learning at Sebatik Vocational School, the aim of the phenomenological study will be more focused on understanding the experiences and perceptions of principals, teachers and students regarding the principal's leadership and its impact on student achievement in learning. IPA. Data sources were obtained from 4 research respondents. Respondents included school principals, teachers and students involved in science learning at Sebatik Vocational School. Data collection techniques are interviews, observation and documentation. The validity of the data used is using triangulation techniques. Data analysis using the Miles, Huberman, and Saldana models. According to Miles et al. (2014), analysis consists of three activity flows that occur simultaneously, namely: data condensation, data presentation, and conclusion drawing, as in Figure 1.

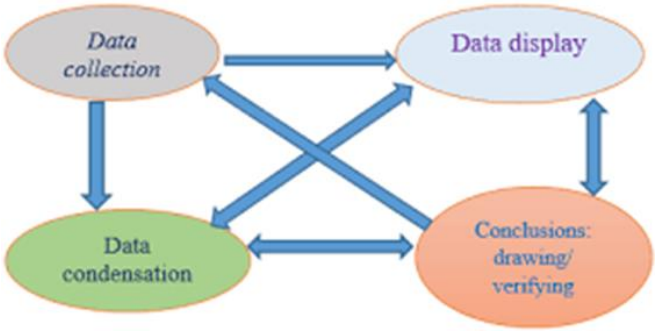

Figure 1. Interactive data analysis model

Result and Discussion

Based on the results of the discussion in this research, the research flow above can be explained from the results of data condensation, data display, and conclusion drawing, this is explained below.

Data Condensation

Table 1. Data Condensation

Respondent	Status	Response to achievement in science learning
AA	Headmaster	Highlights budget constraints in science equipment updates that hinder interactive learning.
GA	Teacher	Expressing difficulties in presenting science material practically due to limited facilities and equipment.
DA	Student	Feeling obstacles in understanding science concepts due to lack of access to relevant teaching materials.
SK	Student	Experiencing difficulties in conducting practical experiments due to limited laboratory facilities.

The data condensation process involves collecting and reorganizing information obtained from various sources, such as interviews, observations, and document analysis. In the context of this research, it was found that four respondents (school principals, teachers and students) had been condensed so that relevant information could be presented in a more structured manner. This includes identifying the main findings related to the leadership role of the principal in improving student achievement in science learning at Sebatik Vocational School. From the results of the data collection above, the data condensation below was obtained.

Presentation of Data (Data Display)

From the results of the data condensation above, it can be explained in more detail in the presentation of data found by researchers in the field, this is explained as follows.

Table 2. Display Data

Respondent	Data display	Efforts to improve principal leadership
AA (Principal)	AA realizes that budget constraints are the main obstacle in updating science equipment in schools. He was frustrated that limited budgets hampered his ability to provide adequate facilities for students and teachers. AA believes that with adequate budget support, the quality of science learning can improve significantly at Sebatik Vocational School.	AA fights for larger budget allocations for science equipment updates, as well as advocates for policies and programs that support improved learning facilities. AA leads initiatives to seek additional resources, such as grant funding or collaboration with external parties, to support the procurement of new equipment or improvements to laboratory facilities.
GA (Teacher)	GA feels limited in providing practical experience to students due to limited facilities and equipment. He had difficulty designing interactive and relevant learning activities without adequate equipment support.	With support from the school principal, GA can be involved in the process of planning and implementing innovative learning, even with limited facilities.

Respondent	Data display	Efforts to improve principal leadership
	GA hopes that there will be updates to laboratory facilities and better access to relevant teaching materials to improve the quality of science teaching.	School principals can provide moral and professional support to teachers in facing challenges, as well as providing space for creative ideas in presenting science material effectively.
DA (Student)	DA feels frustrated because the lack of access to relevant teaching materials makes it difficult for him to understand science concepts well.	School principals can ensure that students feel heard and cared for by facilitating forums or forums for student participation in formulating policies or learning programs.
	He expressed his desire to have more learning resources that are interactive and relevant to the curriculum.	Through open and transparent communication, school principals can build strong relationships with students, provide moral encouragement, and motivate them to continue to excel despite facing challenges.
	Even though DA tries hard, limitations in facilities and access to learning resources limit his ability to achieve optimal achievement in science learning.	
SK (Student)	SK experienced difficulties in conducting practical experiments due to limited laboratory facilities.	
	He felt frustrated because he could not properly follow the practicums and experiments required in learning science.	
	SK hopes that there will be improvements to laboratory facilities that can improve his practical learning experience and academic results in science subjects.	

Conclusion (Conclusion Drawing)

Based on the results of data condensation and data presentation as described previously, the following conclusions can be drawn. Limited laboratory facilities and science equipment at Sebatik Vocational School are the main obstacles in implementing interactive and practical learning for students. This obstacle is largely caused by limited school budgets to update equipment and improve facilities. The impact is felt in the effectiveness of the science learning process, limiting teachers' ability to present material practically and inhibiting students' ability to actively participate in experiments and practicums (Talwar et al., 2023). Main stakeholders, such as school principals, teachers and students, have similar perceptions regarding the problem of limited facilities and budget, with each feeling its impact in the science learning context (Wijanarko et al., 2024).

To overcome these challenges, greater efforts are needed to expand access to relevant teaching materials and improve laboratory facilities (Das et al., 2020). Principal leadership is key in advocating for adequate budget allocations and coordinating facilities improvement efforts (Yusmairoh et al., 2023). In addition, there is a need to increase communication and collaboration between school principals, teachers and students in overcoming science learning challenges, including brainstorming solutions and sharing ideas (Sari et al., 2024). Thus, the conclusion that can be drawn is the need for immediate action to overcome the limited facilities and budget in science learning at Sebatik Vocational School, with a focus on efforts to improve facilities, procure equipment, and increase collaboration between stakeholders to improve the quality of learning.

Conclusion

Based on the research results and discussion, it can be concluded that efforts to improve the leadership of the school principal in student achievement in science learning at Sebatik Vocational School is a crucial step in improving the quality of education at the school. The leadership of the school principal has a significant role in determining school success, especially in terms of creating a conducive learning environment and motivating teachers and students to achieve maximum achievement. Efforts to improve principal leadership at Sebatik Vocational School could include steps such as advocating for adequate budget allocation for updating science facilities and equipment to improve the quality of learning. In addition, school principals need to lead initiatives to expand access to relevant teaching materials and support the use of innovative learning methods. Not only that, school principals are also expected to encourage close communication and collaboration between teaching staff and students to overcome common challenges and formulate effective solutions. The final step, developing leadership strategies that are inclusive and responsive to the needs of students and school staff, is also key in efforts to improve student achievement in science learning at Sebatik Vocational School. Thus, efforts to improve the leadership of school principals can have a significant positive impact on student achievement in science learning at Sebatik Vocational School. This will help create a learning environment that allows students to reach their full academic potential and prepares them to face future challenges.

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Author Contributions
Author contributions include I.M, and S: collecting data, analyzing data, writing original drafts, and so on; I.M, and S: focus on methodology and review writing.

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Conflicts of Interest
The authors declare no conflict of interest.

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