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Principal's Strategy in Fostering a Literacy and Numeracy School Culture at SDN Setono Surakarta

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ABSTRACT

Low literacy and numeracy among Indonesian elementary school students call for school leadership that embeds both competencies in daily school life. This study aims to describe the principal's strategy in fostering a literacy and numeracy school culture at SDN Setono Surakarta, including supporting factors, obstacles, and solutions. A descriptive qualitative approach with a case study design was used. Data came from five informants (the principal as key informant, two teachers, and two students), complemented by documents such as the school work plan and report cards. Data were collected through semi-structured interviews, direct observation, and document review, validated through source and methodological triangulation, and analyzed using the Miles and Huberman interactive model. Four strategies emerged from synthesizing interview, observation, and documentation data: program planning based on student needs, program implementation and organization, utilization of the school environment as a learning resource, and monitoring and evaluation. Adequate facilities, teacher consistency, and parental involvement supported these strategies, while differences in student ability and low reading interest remained obstacles. The study concludes that a literacy and numeracy culture grows when the principal links planning, people, resources, and evaluation, offering practical implications for elementary school leadership.

1. Introduction

Numeracy is one of the fundamental competencies that determines students' ability to think logically, solve problems, and make decisions based on quantitative information in everyday life (Novitasari, 2022). The Indonesian government has identified literacy and numeracy as one of the key indicators of educational quality through the Merdeka Belajar and National Assessment policies (Muliastri, 2024). However, various evaluation results indicate that Indonesian students' numeracy skills remain a serious challenge, particularly at the elementary school level

(Kamaludin, 2024). The low literacy and numeracy skills are reflected in the results of the 2018 Programme for International Student Assessment (PISA), which ranked Indonesia 72nd out of 79 countries with a math score of 379, far below the OECD average of 489 (OECD, 2019). The 2022 PISA results show that Indonesia's math score was around 366, compared with the OECD average of 472, and approximately 82% of students have not reached Level 2, which is the minimum competency required to apply mathematical concepts in real-life contexts (OECD, 2023).

Other research also shows that elementary school students in Indonesia still have difficulty solving context-based mathematics problems even though they have fairly good basic math skills (Rakhmawati & Mustadi, 2022). In addition, data from the Indonesian National Assessment Program (INAP) shows that 77.13% of fourth-grade elementary school students fall into the low math literacy category, while only 2.29% are in the good category (Ismafitri et al., 2022). This condition indicates that low literacy and numeracy not only affects students' learning outcomes but could also potentially impact the quality of human resources and the nation's competitiveness in the future. Various factors affect students' low literacy and numeracy skills, one of which is teachers' limited ability to design engaging, contextual lessons that encourage higher-order thinking skills. Teachers still struggle to develop project-based learning, educational games, and questions that can stimulate critical and creative thinking (Kusumaningrum et al., 2024). Literacy and numeracy are skills needed in everyday life, such as managing finances, understanding data, and making decisions (Khakima et al., 2021). However, students are not yet accustomed to applying mathematical concepts in real-world contexts, so their numeracy skills have not developed optimally (Sudarti, 2018).

The success of literacy and numeracy improvement programs is determined not only by the curriculum or teacher competencies, but also by the leadership of the principal. The principal holds a strategic position as an instructional leader responsible for designing policies, building school culture, fostering teacher professionalism, and creating a learning environment that supports the strengthening of literacy and numeracy (Sanjaya et al., 2025). As both an instructional and managerial leader, the principal has the responsibility to formulate the vision, strategy, and school climate that support the improvement of education quality (Mala et al., 2021). The principal also acts as a motivator, a driver for teachers, and a policy maker in developing literacy programs systematically and continuously (Dewi, 2023). The principal's involvement in building school culture is important because it can shape collective behavior that supports achieving the school's vision (Anggraini et al., 2025). A school culture that supports literacy and numeracy is marked by strong leadership, a positive learning environment, integrating numeracy into learning activities, and collaboration with parents and the community (Pratiwi et al., 2021).

Previous research shows that principals play an important role in developing a culture of literacy and numeracy through policies, habitual programs, learning supervision, and strengthening school culture. Marzuki et al. (2025) show that the principal's literacy strategy at SD 01 Aisyiyah Muhammadiyah Raja Ampat has successfully improved students' interest in reading, character, and academic

achievement. Nurwahidah and Iskandar (2022) found that school principals' leadership affects the improvement of elementary students' multiliteracy skills. Meanwhile, research by Ningtyas et al. (2025) shows that principals' strategies can improve literacy and numeracy skills by strengthening the school's quality culture. Nevertheless, these studies generally focus on literacy rather than numeracy, or were conducted at the secondary school level. Therefore, an in-depth examination of principals' strategies for fostering an integrated culture of numeracy at the elementary school level particularly in the context of schools with improving academic performance still requires further exploration.

This issue does not stop at the elementary school level either. A phenomenological study by Sefiana and Mustofa (2026) among vocational high school students in Surakarta, Sukoharjo, and Karanganyar found that there is an imbalance between literacy and numeracy skills, with numeracy showing gradual improvement while literacy remains a significant challenge, particularly in reading comprehension, analytical reasoning, and the interpretation of long texts. This situation is influenced by digital distractions, limited reading habits, a weak foundation in learning, and emotional factors such as low self-confidence and test anxiety. These findings indicate that the literacy and numeracy crisis spans all educational levels, making it increasingly important to strengthen school culture starting in elementary school so that a solid foundation in literacy and numeracy is established before students enter secondary school.

The development of a literacy and numeracy culture remains an important concern in elementary education, particularly in supporting students to develop basic reading, writing, and mathematical skills. At the school level, strengthening these competencies requires not only classroom instruction but also consistent efforts to establish learning habits and a supportive school environment. In this context, the principal has an important role in directing programs, coordinating teachers, providing learning support, and creating conditions that encourage the continuous development of students' literacy and numeracy skills. However, the implementation of such efforts may involve various supporting factors and challenges that require appropriate school-level responses.

Therefore, examining how principals formulate, implement, and evaluate strategies for fostering a literacy and numeracy school culture is relevant to understanding how these practices are developed in an elementary school context. Accordingly, this study aims to describe the principal's strategies in fostering a literacy and numeracy school culture at SDN Setono Surakarta, including the planning and implementation of programs, supporting and inhibiting factors, and efforts to address the challenges encountered. Through a qualitative approach, this study seeks to provide an empirical description of school leadership practices in fostering literacy and numeracy and to contribute contextual insights for the continuous development of literacy and numeracy programs in elementary schools.

2. Methodology

This study employs a descriptive qualitative approach with a case study design. A descriptive qualitative approach was chosen because it aims to describe in detail the phenomenon of school principals' strategies without using hypotheses or experimental interventions, in order to facilitate a comprehensive understanding of the social realities observed in the field (Furidha, 2023). The case study design was used to conduct an in-depth analysis of a specific case involving literacy and numeracy strategies in their natural context at a single school, by collecting data from various sources such as observations, document analysis, field notes, and in-depth interviews (Salsabila et al., 2025).

The study was conducted at Setono Surakarta Public Elementary School, located at Jl. Liris No. 54, Pajang, Laweyan District, Surakarta City, Central Java. This location was selected through purposive sampling, given that the school possesses unique characteristics in the implementation of its school culture. The data in this study encompass all empirical information related to the planning, implementation, and evaluation of the principal's strategies, the dynamics of school culture, and the development of literacy and numeracy as reflected in learning activities. Primary data sources were obtained from the 1 school principal as the key informant, as well as two teachers (1 from an upper-grade class and 1 from a lower-grade class) and 2 students (one from an upper-grade class and one from a lower-grade class) as supporting informants, while secondary data sources were obtained from supporting documents such as the school work plan, teachers' instructional materials, and visual documentation of literacy and numeracy practice activities.

Data collection was conducted in three ways. First, semi-structured interviews were conducted with school principals, teachers, and students to explore program planning, the implementation process, policy evaluation, school cultural values, and perceptions of supporting and hindering factors. Second, direct observations of the school's physical environment (reading corners, numeracy resources, teaching aids) and social environment (numeracy and literacy routines, teachers' teaching methods, teacher-student interactions). Third, a review of official school documents related to literacy and numeracy programs.

The validity of the data was ensured through source triangulation and methodological triangulation. Source triangulation is conducted by cross-checking data from the school principal and comparing it with statements from teachers and students, while methodological triangulation is conducted by comparing interview results with observation findings and existing documents (Sugiyono, 2013; Susanto et al., 2023). Data analysis is based on Miles and Huberman's interactive model, which consists of three stages: data reduction (summarizing and focusing the data on aspects of school strategy and culture), data presentation (presenting the data in the form of a systematic narrative), and drawing conclusions and verification (Sugiyono, 2019).

3. Results and Discussion

Result

Research results show that the principal's strategy in fostering a literacy and numeracy culture is carried out through four main stages, namely program planning, implementation and organization, utilization of the school environment, and program monitoring and evaluation. At the planning stage, the principal formulates the vision, targets, and work programs for literacy and numeracy together with teachers and the school committee so that the programs are aligned with students' needs and the school's conditions. In the implementation and organization stage, the principal assigns tasks to teachers and school staff, arranges the schedule of activities, and ensures that the necessary facilities and resources are available. The utilization of the school environment is reflected in the use of the library, reading corners, classroom walls, and other learning spaces as media that encourage students to read, write, and practice numeracy skills in daily activities. Meanwhile, program monitoring and evaluation are carried out routinely through classroom supervision, discussions with teachers, and reviews of program achievements to identify obstacles and determine follow-up actions. Based on Table 1, the findings indicate that the principal serves not only as a policy maker but also as a driver and supervisor in implementing a culture of literacy and numeracy at the school.

Table 1. Findings on Principals' Strategies in Cultivating a Literacy and Numeracy Culture

Strategy Aspect	Research Findings
Program Planning	The literacy and numeracy program is designed based on the identification of student needs, learning outcomes, teacher observations, and the Merdeka Belajar policy and National Assessment.
Program Implementation	Literacy and numeracy activities are held every morning for 30 minutes before class. Teachers integrate reading activities, educational games, numeracy quizzes, and group discussions.
Utilization of the School Environment	The school provides a library, reading corners, educational posters, numeracy materials, and math manipulatives as learning resources.
Monitoring and Evaluation	The principal conducts classroom observations, monitors routine activities, and holds evaluation meetings with teachers to review the program's progress.

Program Planning

Planning for literacy and numeracy programs begins with the development of programs that are oriented toward students' needs and current education policies. School principals view literacy and numeracy as a continuous process of habit formation designed to help students become accustomed to understanding information and applying numeracy concepts in their daily lives, as explained below:

"A culture of numeracy is a continuous practice fostered within the school environment to help students develop the habit of thinking by using their ability to

read, understand information, and apply numerical or mathematical concepts in their daily lives.”

This approach is implemented through a 30-minute numeracy practice program that takes place before core instruction begins. The program is designed based on an assessment of students’ needs, as determined by their learning outcomes, teacher observations, and their ability to understand numeracy problems, as explained by the principal below:

“At first, we identified the students’ needs based on their academic performance, teachers’ observations, and their ability to understand numeracy problems.”

The interview findings are consistent with the document analysis, which showed that the literacy program was developed in relation to students’ learning needs and classroom conditions. The “Follow-Up on Educational Activities through Literacy” document also shows that the GELIS CERIA program was formally implemented at the school. These findings indicate that student needs and teacher observations were considered in planning the literacy and numeracy activities, with the principal coordinating the program at the school level. The results of this assessment were discussed at a school meeting with teachers to determine the type of program best suited to the students’ needs, while continuing to adhere to the Merdeka Belajar policy and the National Assessment guidelines. Based on the document titled “Follow-Up on Educational Activities through Literacy” obtained from Setono Public Elementary School in Surakarta in 2024, it is noted that the school is implementing a literacy program titled “GELIS CERIA” (School Literacy Movement: Smart, Cheerful, Joyful), using assignments and discussions as its initial methods. According to this document, the 30-minute literacy session is held every morning before lessons begin, with a different literacy theme each day, and literacy and numeracy (LINUM) is scheduled on Thursdays, as shown in Figure 1.

TINDAK LANJUT KEGIATAN PENDIDIKAN MELALUI LITERASI
SD NEGERI SETONO KOTA SURAKARTA TAHUN 2024

No.	Satuan Pendidikan	Start	Metode awal	Continue	Tantangan / Hambatan	Mitigasi	Fasilitator
1.	SD Negeri Setono	"GELIS CERIA " (Gerakan Literas Sekolah " Cerdas, Riang, Gembira")	Penugasan,diskusi	Kegiatan Literasi Pagi 30 Menit Sebelum Pembelajaran.	Siswa kadang ada yang belum hadir.	Menulis Jadwal kegiatan atau menginformasikan kepada siswa	Guru kelas ,guru mapel
		1.Senin : Literasi Nasional (LINAS) Disi dengan Kegiatan Upacara Bendera Hari Senin		Upacara bendera,Upacara hari besar.			
		2. Literasi Baca Tulis (LIBAS) Disi dengan kegiatan membaca buku di pojok kelas ,menulis cerita pagi,menulis puisi,cerpen.	Tugas,diskusi	Pojok Baca Kelas	Rak dan koleksi buku di kelas kurang memadai	Membuat program 1 siswa 1 buku dan membuat rak sederhana.	Guru kelas
		3. Rabu : Literasi Keimanan dan Kewawasan (LIMTAQ) Disi dengan Melaksanakan Sholat Dhuha Bersama di Musholla Sekolah.	Prairek terbimbing	Kegiatan sholat di musholla	Siswa tidak membawa peralatan sholat	Menginformasikan pada siswa sebagai pembiasaan	Guru PAI
		4. Kamis : Literasi Numerasi (LINUM) Disi dengan Kegiatan Membuat blok Literasi kelas (symbol,lambang,bangun,berhitung	Penugasan	Berhitung	Siswa malas karena belum bisa berhitung	Memberikan bimbingan dengan menelaah maksud dari permasalahan / soal	Guru Kelas
		5. Jumat : Literasi Kesehatan dan Literasi Lingkungan(LIRHAT LINGKUNG) Disi dengan kegiatan Perawatan Kesehatan (Senam ,cuci tangan ,Sikat gigi ,Pemeriksaan kuku,rambut ,Sepatu,baju)	Penugasan ,demonstrasi	Senam ,pemeriksaan kuku,rambut,menjitan tanaman	Siswa ada yang gojek ,jajan	Pengawasan dan bimbingan guru	Guru Penjales dan guru kelas

Figure 1. Schedule of Educational Activities through Literacy (GELIS CERIA)

Program Implementation and Organization

The media used to support the literacy program during classroom observation are shown in Figure 2. Classroom observations revealed that the literacy and numeracy program was consistently conducted before regular classroom instruction. Teachers facilitated learning through interactive digital media, contextual numeracy questions, educational games, and guided discussions, while students actively participated by answering questions and responding to visual learning materials. These observations indicate that the implementation of literacy and numeracy placed considerable emphasis on student engagement rather than conventional teacher-centered instruction, as shown in Figure 2.



Figure 2. The Use of Media to Support Literacy Programs

The literacy and numeracy program was implemented through a 30-minute daily morning activity involving all students and classroom teachers. In organizing the program, the principal designated teachers as the primary implementers, while the principal served as a guide, supervisor, and source of support, as described below:

“Classroom teachers are the primary implementers of literacy and numeracy activities in the classroom, while schools provide guidance and support regarding the implementation of the program.”

This statement is consistent with the classroom observation findings described above, in which teachers rather than the principal were observed directly delivering the numeracy activities each morning, while the principal was not present for the full session. The correspondence between the principal’s account and the observations indicates that the division of responsibilities described in the interview was enacted at the classroom level rather than existing only as a formal policy. This finding clarifies that the principal’s strategic role operates primarily through the conditions under which teachers implement the program, including time allocation, teacher autonomy, and monitoring. Thus, the principal’s leadership in fostering

literacy and numeracy was exercised largely through empowering and supporting teachers rather than through direct pedagogical delivery. The principal also supported teachers' motivation by providing them with opportunities to develop teaching materials and share best practices.

"I also provide support to teachers by giving them the freedom to develop teaching materials, use educational games, and share best practices with one another."

The variety of instructional approaches recorded during classroom observations indicates that teachers used different methods, including interactive digital media, numeracy games, and guided discussions. This finding is consistent with the principal's statement that teachers were given opportunities to develop teaching materials and use different instructional approaches. The evidence therefore suggests that teacher autonomy was one aspect of the principal's support for program implementation. Teachers integrate literacy and numeracy through number games, guessing games, and the use of objects found around the classroom as counting aids, as explained by the following teacher.

"I often use number games, guessing activities, reading stories related to simple math, or using objects found around the classroom as teaching aids for math."

This matches the games and object-based counting activities recorded during classroom observation, indicating these methods are habitual practice rather than performed for the research visit. The teacher's use of everyday objects as counting aids also reflects a resourceful approach that does not depend on specialized materials, which is notable given the material limitations identified later as a barrier, and illustrates how the autonomy granted by the principal translates into concrete pedagogical variation at the classroom level. Students also expressed positive responses to the learning activities. One student explained:

"I like math games the most because they're fun and I can learn with my friends."

The student's response is consistent with the classroom observation, which recorded active participation during game-based learning activities. The interview and observation findings therefore indicate that educational games were perceived positively by at least some students and were associated with active participation during the observed activities.

Utilization of the School Environment

A culture of numeracy is also supported by the use of the school's physical environment as a learning resource. Field observations indicated that the school environment was intentionally organized to support students' literacy and numeracy activities. Reading corners, numeracy posters, classroom displays, mathematics manipulatives, and library collections were actively utilized during literacy sessions rather than functioning merely as classroom facilities. In Figure 3, students can be seen independently selecting reading materials and engaging in reading activities before regular classes begin, indicating that the school environment was used as part of the literacy activities.

“The school makes use of various facilities, such as the library, classroom reading corners, and classroom displays, to support literacy and numeracy activities.”

The observation showed students selecting reading materials and using the reading corner before formal instruction. This observation supports the interview statement that the school’s physical facilities were used to support literacy and numeracy activities.



Figure 3. Student Activities in the Reading Corner

Program Monitoring and Evaluation

Monitoring and evaluation are conducted periodically through classroom supervision, observation of literacy and numeracy activities, and evaluation meetings with teachers.

“I supervise by observing classes firsthand and monitoring the implementation of literacy and numeracy activities in the morning.”

During the research team’s field visits, the principal was observed moving through classrooms during morning sessions. This observation is consistent with the principal’s statement regarding direct classroom supervision and indicates that monitoring was conducted through firsthand observation of program implementation. The evaluation focused on student engagement, their ability to understand simple numeracy problems, their willingness to answer questions, and the consistency of program implementation, all of which were then discussed during the school’s evaluation meeting.

“The evaluation results are discussed with the teachers during the school evaluation meeting.”

The interview findings indicate that evaluation was discussed with teachers and was therefore connected to the implementation of the program. This suggests that

teachers were involved not only in implementing the activities but also in discussing the results of program evaluation.

Supporting and Hindering Factors

The success of implementing a culture of literacy and numeracy at Setono Public Elementary School was influenced by a number of supporting factors, namely: (1) the availability of adequate facilities and infrastructure, such as a library, reading corners, numeracy materials, and math teaching aids; (2) the principal's support for teachers in the form of motivation, guidance, and opportunities to innovate; (3) teachers' consistent engagement in integrating literacy and numeracy into instruction; (4) the involvement of parents and the school committee, which reinforces the habit of reading and counting at home. Document analysis also revealed collaboration between the school and the Surakarta Education Office through the regular implementation of a mobile library program, as shown in Figure 4. During the observation period, students enthusiastically accessed and selected books provided by the mobile library service, indicating that support from external institutions also contributes to strengthening students' reading habits and expanding access to literacy resources.



Figure 4. Mobile Library from the Department of Education

The study also identified several barriers. The first was variation in students' abilities to read and understand numeracy concepts, as explained by the school principal:

"Some of the challenges faced include students' varying abilities."

This statement is consistent with classroom observations, in which students demonstrated differences in response time and confidence when exposed to similar instructional activities. The finding indicates that differences in students' abilities represented an ongoing implementation challenge that required teachers to adjust instructional approaches. The second obstacle was low interest in reading among some students. The third was the limited availability of certain learning materials, while the fourth was low self-confidence among some students in solving problems or expressing their opinions. Classroom observations also showed that some

students still experienced difficulties when reading and were hesitant to attempt numeracy problems. Table 2 summarizes the supporting and hindering factors identified through the triangulation of interview, observation, and documentation data.

Table 2. Factors Supporting and Hindering a Culture of Literacy and Numeracy

Supporting Factors	Obstacles
Adequate facilities and infrastructure	Differences in students' abilities
Support from the principal	Some students' low interest in reading
Active teacher involvement	Limitations of certain learning materials
Support from parents and the school committee	Low self-confidence among some students

Solutions for Overcoming Obstacles

To address these challenges, the principal and teachers implemented several solutions. First, they adopted varied and engaging teaching methods, including educational games, numeracy quizzes, group discussions, and visual aids, as explained by the principal:

"The solution is to use a wider variety of methods, such as games, interactive Q&A sessions, and visual aids, to make the lessons more engaging for students."

This finding is consistent with the instructional variety documented during classroom observations, including interactive digital media, numeracy games, and guided discussions. Method diversification therefore functioned as both a regular instructional practice and a response to differences in students' engagement and learning needs. Second, teachers provided additional support to students who experienced learning difficulties, individually or in small groups.

"Teachers also provide special support to students who are still struggling."

This practice indicates that teacher support was adapted according to students' individual needs. However, because the support was primarily implemented at the classroom level, the consistency of this practice across all teachers and classrooms could not be fully established from interview data alone. Third, teachers strengthened collaboration by sharing best practices and learning materials. Fourth, parental involvement was encouraged to support the development of reading and mathematics habits at home. Table 3 summarizes the solutions identified from the interview, observation, and documentation data.

Table 3. Solutions Implemented by Schools

Obstacle	Solutions
Students' diverse abilities	Individual support and differentiated instruction
Low interest in reading	Educational games, quizzes, and engaging visual media
Media limitations	Development of simple teaching aids by teachers
Lack of self-confidence	Group discussions and collaborative learning

Discussion

Principals' Strategies for Fostering a Culture of Literacy and Numeracy

The findings indicate that the principal's strategy for fostering a culture of literacy and numeracy at SDN Setono operated as a continuous leadership process involving four interconnected stages: planning based on student needs, program implementation and organization, utilization of the school environment, and monitoring and evaluation. These four stages were derived from the triangulated synthesis of interview, observation, and documentation data rather than from a single source of information. The convergence among the three data sources strengthens the interpretation that the identified strategies represent patterns of practice observed across the school context.

The findings are consistent with the model of principal roles as educator, motivator, and innovator proposed by Hardiman et al. (2025) in their study at SDN Brebes 09. As an educator, the principal at SDN Setono provided guidance and demonstrated examples related to literacy and numeracy; as a motivator, the principal encouraged teacher and student participation through support and appreciation; and as an innovator, the principal facilitated the development of creative teaching methods. The findings indicate that these roles were interconnected rather than operating as separate functions. The principal's strategy involved translating program objectives into practices understood and implemented by members of the school community.

During the planning stage, the findings indicate that the development of literacy and numeracy at SDN Setono was not limited to establishing a program but also involved determining activities relevant to the school's conditions and students' needs. This finding is consistent with Fahrudin (2023), who describes strategy formulation as a process of identifying internal and external organizational conditions before establishing goals and selecting appropriate strategies. The findings also support Hidayah and Mujib (2024), who emphasize the importance of developing school programs based on a clear vision and school needs, and are consistent with Ningtyas et al. (2025), who emphasize systematic program planning as an important foundation for literacy and numeracy.

At the implementation and organizational stages, the findings show that the principal's strategy became visible through leadership, communication, motivation, coordination, and the involvement of teachers and students. These findings are consistent with Selvia and Muttaqin (2024), whose strategic implementation theory emphasizes leadership, communication, and motivation in translating strategy into action. They also correspond with the principal's roles as manager, leader, motivator, and supervisor described by Ulya et al. (2026). Furthermore, the findings support Dewi (2023), who indicates that principal leadership contributes to the development of literacy culture through motivation and guidance for teachers. At SDN Setono, implementation required the transformation of an established plan into collective action, with teachers playing an important role in translating the program into classroom practices.

With regard to the use of the school environment, the findings indicate that the physical environment at SDN Setono functions not merely as supporting infrastructure but also as a medium through which literacy and numeracy practices can become visible and integrated into school life. This finding is consistent with school culture theory proposed by Angelina et al. (2024), which explains that school culture can be embodied through physical artifacts such as spatial arrangements, symbols, and learning materials. It also corresponds with the indicators of literacy and numeracy culture identified by Rahma and Muradlo (2023), particularly the importance of infrastructure and program consistency, who found that the success of a school literacy culture is influenced by the principal's ability to provide a physical environment that supports learning.

In contrast, Nelsy et al. (2022) reported that the implementation of a literacy program at SDN 006 Bangsal Aceh Dumai had not been fully realized because of an unsupportive environment, incomplete facilities and infrastructure, and insufficient teacher role modeling, which contributed to students' low interest in reading and writing despite the program having been implemented for five years. This contrast matters: facility availability alone cannot explain the development of a literacy and numeracy culture, since facilities become educationally meaningful only when organized, utilized, and reinforced through consistent adult behavior. At SDN Setono, the principal's role is therefore not simply that of a provider of facilities but an organizer who connects resources with learning activities and models their use: the physical environment becomes an active component of school culture only in combination with role modeling, consistent use, and leadership support.

In the monitoring and evaluation phase, the findings indicate that evaluation functions as more than a mechanism for determining whether literacy and numeracy activities have been implemented. It provides an opportunity to review implementation and identify aspects that require improvement. This finding is consistent with Selvia and Muttaqin (2024) strategic evaluation theory, which conceptualizes evaluation as a process of reviewing strategy implementation in order to determine corrective actions, and supports Suprpti et al. (2024), who indicate that principal involvement in monitoring and evaluation contributes to the success of literacy programs in elementary schools. Thus, the strategy implemented at SDN Setono reflects a continuous strategic management cycle in which planning, implementation, monitoring, and improvement are connected. This cycle is particularly important in literacy and numeracy because students' learning needs and levels of ability are not uniform and may require adjustments in instructional practices. The principal's role at this stage is therefore not limited to checking whether teachers have complied with a predetermined program, but also involves using information from implementation as a basis for subsequent improvement. This interpretation can be further enriched by the coaching-based academic supervision perspective of Khawadits and Prasajo (2025), which emphasizes reflective dialogue between principals and teachers: active listening and reflective questioning encourage teachers to examine their own practices rather than treat evaluation as an administrative requirement.

For SDN Setono, this supports the school's capacity to learn from implementation and adjust as needed, positioning monitoring and evaluation as a mechanism linking accountability with professional learning. Taken together, the four stages show the principal's strategy at SDN Setono as a continuous leadership cycle rather than independent activities: planning establishes direction, implementation and organization mobilize teachers and students, the school environment makes practices visible and routine, and monitoring and evaluation provide feedback. The principal thus acts not only as policy maker but as educator, motivator, organizer, innovator, and supervisor, roles that interact to translate leadership into everyday routines. The development of a literacy and numeracy culture at SDN Setono therefore depends less on any single program than on the principal's ability to maintain coherence among planning, people, resources, implementation, and evaluation.

Factors Supporting and Hindering Principals' Strategies

The supporting factors identified in this study include the availability of facilities and infrastructure, principal support for teachers, teacher enthusiasm, and participatory leadership. These findings are consistent with Rudianto et al. (2025), who identify facilities and infrastructure as important factors in the success of a literacy and numeracy culture. Principal support for teachers is also consistent with the theory of Pangestika et al. (2025), which emphasize principal commitment and teacher enthusiasm as important factors in program success. In addition, the participatory support and direct role modeling demonstrated by the principal correspond with Rohyadi et al. (2025), whose study at Banjarsari 5 Public Elementary School in Serang City demonstrated that participatory leadership and exemplary conduct, combined with togetherness and mutual cooperation, can contribute to the sustainable development of school culture.

However, the findings at SDN Setono suggest that these supporting factors should not be viewed independently. Facilities provide the material conditions for literacy and numeracy activities, but leadership determines how those resources are directed and utilized, while teacher enthusiasm enables the strategy to be translated into everyday practice. Thus, the importance of principal support lies not simply in providing encouragement, but in creating a climate in which teachers feel supported to participate and contribute. The similarity between SDN Setono and the context reported by Rohyadi et al. (2025) therefore suggests that participatory leadership is particularly valuable when a school seeks to develop a culture that requires sustained involvement from multiple members of the school community. The supporting factors in this study consequently reveal an interaction between material resources and human agency: facilities create opportunities, leadership provides direction, and teacher participation converts opportunities into routine practice.

In terms of inhibiting factors, the findings indicate that differences in students' abilities, low reading interest among some students, limited learning resources, and low self-confidence create challenges for the implementation of literacy and numeracy practices. Differences in students' abilities can be related to Piaget's theory of cognitive development, which recognizes variation in the development of

elementary school-aged children and consequently differences in their capacity to understand abstract concepts (Rohmah et al., 2022). The low interest in reading identified in this study also resonates with the broader challenge of low literacy and numeracy performance among Indonesian students reflected in the PISA and INAP results discussed in the introduction, and is consistent with Sefiana and Mustofa (2026), who identify digital distractions and poor reading habits as recurring barriers to literacy development at various educational levels.

Limited learning resources and low self-confidence among some students are likewise consistent with patterns of barriers reported in other elementary school literacy studies. Importantly, these barriers operate at different levels. Differences in students' abilities and confidence are individual-level challenges, whereas limited learning resources represent a structural challenge within the learning environment. This distinction matters because a single uniform strategy is unlikely to address all these barriers: at SDN Setono, the principal's strategy needs to accommodate student diversity while strengthening the conditions in which teachers work, so that activities are flexible enough to respond to differences in readiness, interest, confidence, and access to resources rather than simply increasing the number of activities.

The findings also differ from the study by Damanik et al. (2023), which placed greater emphasis on barriers related to the general implementation of school programs. In the present study, barriers were more frequently associated with student characteristics, particularly uneven reading and numeracy skills. This difference suggests that the challenges encountered in developing a literacy and numeracy culture are context-dependent. Although schools may adopt similar programs, the factors that determine their implementation can differ according to students' characteristics, available resources, and school conditions. The theoretical implication is therefore that the development of literacy and numeracy cannot be explained solely through the existence or quality of school programs. It also requires attention to the interaction between student characteristics and the learning environment. The practical implication for SDN Setono is that school leadership needs to facilitate adaptive strategies rather than assuming that the same approach will produce similar responses among all students. This finding strengthens the argument that the principal's strategic role includes creating conditions that allow teachers to respond flexibly to student diversity rather than focusing exclusively on program compliance.

Solutions for Overcoming Cultural Barriers to Literacy and Numeracy

The findings indicate that the solutions implemented to address the identified barriers included varied teaching methods, additional support for students experiencing difficulties, development of simple learning materials, and parental involvement in fostering reading and mathematics habits at home. These solutions align with Kasanah and Mutofin (2026), who emphasize reading habits, reading corners, literacy activities, and parental involvement in strengthening literacy and numeracy culture. The findings are also in line with Bhala et al. (2025), who emphasize engaging and contextual learning, and Pangestika et al. (2025), who

demonstrate the use of creative learning media. Furthermore, the findings support Fahrudin (2023), who emphasizes collaboration among principals, teachers, and the community in supporting literacy and numeracy programs.

The significance of these solutions at SDN Setono lies in their correspondence with the specific barriers identified. Varied teaching methods addressed differences in engagement and ability, individual guidance supported students experiencing difficulties, simple teaching materials responded to resource limitations, and parental involvement extended literacy and numeracy practices beyond the school. Thus, overcoming barriers involved adaptation of existing practices rather than simply adding new programs. From the perspective of school culture theory, these solutions illustrate how values and practices are reinforced when literacy and numeracy activities are repeatedly experienced by students across different contexts rather than being confined to a single formal activity. Instructional variation broadened participation, individual support assisted students who experienced difficulties, simple materials addressed resource limitations, and parental involvement reinforced learning habits outside school.

Overall, fostering a culture of literacy and numeracy at SDN Setono can be understood as a process of institutionalizing repeated practices through strategic leadership. The process began with identifying needs and establishing direction, continued through mobilizing teachers and students and organizing resources, and was sustained through monitoring, reflection, and adjustment. Facilities, teacher enthusiasm, and participatory leadership supported this process, while differences in student ability, reading interest, resources, and confidence required adaptive responses. The findings therefore provide a contextual account of how principal leadership connects strategic planning with everyday practice, particularly through the alignment of people, resources, routines, and evaluation.

4. Conclusion

The principal plays a crucial role in building and fostering a culture of literacy and numeracy at Setono Surakarta Public Elementary School through a four-stage strategy, program planning based on the identification of students' needs, the implementation and organization of a brief daily literacy and numeracy practice session, the utilization of the school's physical environment as a learning resource, and periodic monitoring and evaluation of the program. The success of these strategies is supported by the availability of facilities and infrastructure, the principal's support for teachers, teacher consistency, the involvement of parents and the school committee, and student enthusiasm, although implementation still faces obstacles such as differences in student ability, low interest in reading, limited learning resources, and a lack of self-confidence among some students. These obstacles are overcome through varied teaching methods, individual mentoring, collaboration among teachers, and ongoing parental involvement. This study recommends that school principals continue to strengthen policies and facilities that support literacy and numeracy programs and expand collaboration with parents and external parties; teachers are expected to continue innovating in teaching methods

and media and to provide intensive attention to students who are struggling; meanwhile, future researchers are advised to conduct studies with a broader scope of schools or using different approaches to obtain a more comprehensive picture of strategies for developing a culture of literacy and numeracy in elementary schools.

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