



The Role of Educational Management Support in Strengthening Teachers' Scientific Literacy and Organizational Citizenship Behavior

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ABSTRACT

Objective: This study aims to examine the role of educational management support in strengthening teachers' scientific literacy and its contribution to Organizational Citizenship Behavior (OCB) in the context of Indonesian education. The study is grounded in the assumption that high teacher motivation toward scientific activities does not automatically translate into consistent academic practices without adequate organizational support. **Method:** A mixed methods approach with a sequential explanatory design was employed. Quantitative data were collected from 38 teachers across several regions in Indonesia using validated Likert-scale questionnaires measuring educational management support, scientific literacy, and OCB. Descriptive and inferential statistical analyses were conducted, followed by qualitative data collection through in-depth interviews with selected participants to further explain the quantitative findings. The qualitative data were analyzed using thematic analysis, and integration was carried out at the interpretation stage. **Results:** The findings indicate that teachers' interest in scientific writing is very high, while their practical experience and participation in formal training remain moderate. Educational management support plays a crucial role in bridging this gap by facilitating training, mentoring, time allocation, and academic recognition. Furthermore, strong management support is associated with higher levels of teachers' OCB, reflected in voluntary collaboration, commitment, and proactive engagement in school development. **Novelty:** This study contributes novel empirical evidence by integrating educational management support, teachers' scientific literacy, and OCB within a single analytical framework, highlighting the strategic role of educational management in fostering both academic competence and positive organizational behavior among teachers.

INTRODUCTION

Improving the quality of education in the 21st century requires teachers not only to function as curriculum implementers but also as professional educators who are capable of critical thinking, scientific productivity, and active participation in school organizational development. In this context, teachers' scientific literacy constitutes a crucial aspect that determines their ability to understand scientific information, apply it in instructional practices, and produce scholarly work that contributes to the advancement of educational knowledge and practice (Amala et al., 2022; Kumar & Choudhary, 2025). However, global studies indicate that teachers' scientific literacy remains uneven and often has not yet reached the optimal level required to meet contemporary professional demands (Bybee, 2012; Folsom et al., 2017).

A growing body of research emphasizes that teachers' scientific literacy is not merely associated with instructional competence but also significantly influences their ability to engage in evidence-based decision-making, design reflective learning experiences, and develop instructional innovations that are responsive to students' needs (Avalos, 2011). In Indonesia, the need to strengthen teachers' critical and digital literacy has been shown to contribute to enhanced pedagogical awareness, cognitive

capacity, and professional responsiveness to educational challenges (Dinihari, Solihatun, et al., 2025; Dinihari, Wiyanti, et al., 2025). Teachers who possess strong scientific literacy tend to be better prepared to adapt to curriculum changes, demonstrate greater confidence in scholarly publication, and participate more actively in professional learning communities (Bergmark, 2023; H. Zhang et al., 2024; S. Zhang & Liu, 2019).

On the other hand, the development of teachers' scientific literacy is strongly influenced by the organizational context in which teachers work. Educational management support—such as school policies, facilitation of professional development programs, provision of research infrastructure, and the cultivation of an academic culture—plays a decisive role in determining the extent to which teachers are able to develop their scientific competencies (Guskey, 2002; Opfer & Pedder, 2011). Research on technology-based training management indicates that structured and sustained managerial support significantly enhances teachers' professional competence and encourages their engagement in reflective and scholarly practices (Alamsyah et al., 2025). Previous studies further demonstrate that when educational institutions provide adequate structural and cultural support, teachers' involvement in scientific and professional activities increases substantially (Avalos, 2011; L. Zhang et al., 2024).

Beyond scientific literacy, Organizational Citizenship Behavior (OCB) has also attracted considerable attention within educational research. OCB refers to teachers' voluntary behaviors that extend beyond formal job requirements and contribute positively to school organizations, including assisting colleagues, participating in school development activities, and fostering a supportive work environment (Bismala et al., 2024; Ebrano & Apostol, 2024; Kristiani et al., 2019; Musringudin et al., 2021; Yang et al., 2023). Numerous studies have demonstrated that teachers' OCB plays a critical role in enhancing school effectiveness, strengthening professional collaboration, and improving the quality of educational services (Podsakoff et al., 2000).

Previous research has shown that teachers' Organizational Citizenship Behavior (OCB) does not emerge spontaneously but is shaped by educational management factors, including school leadership, perceived organizational support, job satisfaction, and perceptions of organizational justice (Asif et al., 2025; Fang & Yu, 2023; Holsblat, 2014; Ji et al., 2025). When teachers feel supported, valued, and professionally facilitated by their institutions, they are more likely to exhibit extra-role behaviors that benefit school organizations, as described in organizational support theories (Wen, 2020). Recent empirical studies further suggest that transformational leadership is positively associated with teachers' OCB, mediated by trust and teacher-leader relationships (Lee et al., 2024), and that ethical leadership fosters a supportive climate that enhances discretionary behaviors among teachers (Zacarias & Flores, 2024). Moreover, principals' authentic leadership has been shown to positively influence teachers' organizational commitment and citizenship behaviors (Shie & Chang, 2022).

Nevertheless, most existing studies on teachers' OCB continue to focus primarily on its relationship with leadership and job satisfaction, while the linkage between educational management support, the strengthening of teachers' scientific literacy, and its implications for OCB remains relatively underexplored (Kristiani et al., 2019; Lie et al., 2022; Nakidien et al., 2022). The available literature tends to examine scientific literacy and OCB as separate domains of inquiry, resulting in a limited number of studies that integrate both constructs within an educational management framework.

Furthermore, emerging literacy studies such as media literacy and health literacy are frequently discussed independently of organizational behavior and educational management perspectives, thereby limiting comprehensive integration (Mirza et al., 2021).

In addition, only a small number of studies have explicitly examined how educational management support not only influences the strengthening of teachers' scientific literacy but also encourages teachers to demonstrate OCB as a form of professional commitment to educational institutions. In the context of school quality development, these two aspects are inherently interconnected and have the potential to generate strategic impacts on both teacher professionalism and organizational effectiveness.

These limitations in previous research underscore the scientific significance of the present study. By examining the role of educational management support in strengthening teachers' scientific literacy and its contribution to Organizational Citizenship Behavior, this study seeks to provide a more comprehensive understanding of the mechanisms through which school policies, facilities, and managerial practices influence teachers' scientific competence and professional behavior.

In many Indonesian schools, teachers continue to face structural barriers such as excessive administrative responsibilities, limited institutional time allocation for scientific writing, insufficient mentoring systems, and the absence of sustainable academic support policies. As a result, teachers' motivation toward scientific activities often fails to develop into consistent scholarly practices and professional engagement.

Based on this rationale, the present study addresses the following research questions: (1) How does educational management support contribute to the strengthening of teachers' scientific literacy? (2) How does teachers' scientific literacy relate to Organizational Citizenship Behavior (OCB)? and (3) How does educational management support encourage teachers' OCB within the context of Indonesian education? By explicitly addressing these questions, the study is expected to provide both theoretical and practical contributions to the advancement of educational management, teacher professional development, and school-based academic culture in Indonesia.

RESEARCH METHOD

This study employed a mixed-methods approach using a sequential explanatory design. In this design, quantitative data were collected in the first phase to obtain empirical evidence regarding educational management support, teachers' scientific literacy, and Organizational Citizenship Behavior (OCB). The qualitative phase was subsequently conducted to explain and enrich the quantitative findings through a deeper exploration of teachers' experiences. This design was considered appropriate because it enabled the researchers to combine statistical patterns with contextual interpretation, thereby providing a more comprehensive understanding of the phenomenon under investigation.

The quantitative phase involved 38 teachers selected through purposive sampling. The participants were included based on two main criteria: having at least two years of teaching experience and being actively involved in professional development activities. The respondents were drawn from several regions across Indonesia, including West Java, Central Java, East Java, Banten, Lampung, West Sumatra, South Sumatra, North

Sumatra, Jambi, and West Kalimantan, to reflect diverse educational management contexts. In the qualitative phase, a subset of participants from the quantitative sample was selected for in-depth interviews. These participants were chosen based on their questionnaire responses to reflect varying levels of perceived educational management support, scientific literacy, and OCB, so that the qualitative findings could provide a richer explanation of the quantitative results.

The quantitative data were collected using Likert-scale questionnaires covering the dimensions of educational management support, teachers' scientific literacy, and Organizational Citizenship Behavior. The instruments were reviewed in terms of content relevance and consistency prior to use. Quantitative data were analyzed using descriptive and inferential statistical techniques to identify patterns and relationships among the variables under study.

Meanwhile, qualitative data obtained from the interviews were analyzed through thematic analysis, which involved coding, categorizing, and developing themes relevant to the research objectives. Participants for the qualitative phase were purposively selected based on variations in questionnaire scores, including teachers with high, moderate, and low levels of perceived management support and scientific literacy, in order to obtain diverse perspectives. The integration of quantitative and qualitative findings was carried out at the interpretation stage in order to produce conclusions that were coherent, complementary, and analytically meaningful. Throughout the research process, ethical considerations were carefully maintained, including informed consent, voluntary participation, and the assurance of data confidentiality. The integration of quantitative and qualitative data was conducted using anonymized coding to ensure participant confidentiality and prevent identification of schools or individuals.

RESULTS AND DISCUSSION

Results

The results of the descriptive analysis indicate that the levels of teachers' scientific literacy and educational management support range from moderately high to very high. Overall, teachers demonstrate a strong interest in scientific writing activities and a good understanding of the components and structure of scientific works. However, limitations remain in terms of practical writing experience and participation in formal training programs. The mean scores for each indicator are presented in the following table.

Table 1. Average of Each Scientific Literacy Indicator and Management Support.

Indicator	Indicator Description	Mean	Category
S1	Interest in writing scientific papers	4,39	Very High
S2	Experience in scientific writing	3,32	Moderate
S3	Barriers to scientific writing	3,47	Moderate
S4	Understanding of scientific writing structure	3,63	Good
S5	Knowledge of scientific paper components	3,87	Good
S6	Experience in attending scientific writing training	3,21	Moderate
S7	Perceived benefits of online mentoring and guidance	3,76	Good

The descriptive analysis results indicate that the levels of teachers' scientific literacy and support related to the development of academic competencies fall within the

moderately high to very high categories. The indicator with the highest mean score is S1 – Interest in scientific writing, which recorded a mean value of 4.39 (very high category). This finding suggests that teachers possess strong motivation and interest in engaging in scientific writing activities, including the preparation of journal articles, research reports, and other academic works. Such a high level of interest represents an important foundation for strengthening teachers’ scientific capacity.

Other indicators that also fall within the high category include S5 – Knowledge of scientific paper components, with a mean score of 3.87, and S7 – Perceived benefits of online mentoring, with a mean score of 3.76, both classified as good. These results indicate that teachers have a solid understanding of the structure, components, and principles of scientific writing and perceive clear benefits from mentoring or writing support programs, particularly those delivered through online platforms. In addition, S4 – Understanding of the scientific writing structure achieved a mean score of 3.63 (good category), suggesting that, in general, teachers understand the overall organization of scientific writing—from the introduction to the conclusion—although there remains room for further improvement.

Meanwhile, several indicators fall within the moderate category. S3 – Barriers to writing obtained a mean score of 3.47, indicating that teachers continue to experience various challenges in the scientific writing process, including time constraints, technical skills, and the availability of academic support. S2 – Writing experience recorded a mean score of 3.32 (moderate category), suggesting that despite a high level of interest in writing, not all teachers have consistently engaged in practical scientific writing activities. Furthermore, S6 – Experience in attending training yielded the lowest mean score of 3.21 (moderate category), indicating that teachers’ participation in scientific writing training programs remains limited and uneven.

Overall, the findings portray a generally positive condition, in which teachers’ interest, knowledge, and perceptions of the benefits of mentoring are relatively high. However, the results also reveal a noticeable gap between interest and actual practice, as reflected in the relatively low levels of writing experience and participation in formal training. This condition underscores the need for strengthened educational management support, particularly in the provision of structured training programs, sustained mentoring, and broader opportunities for academic publication for teachers. The comparative distribution of mean scores across indicators is illustrated in the following figure.

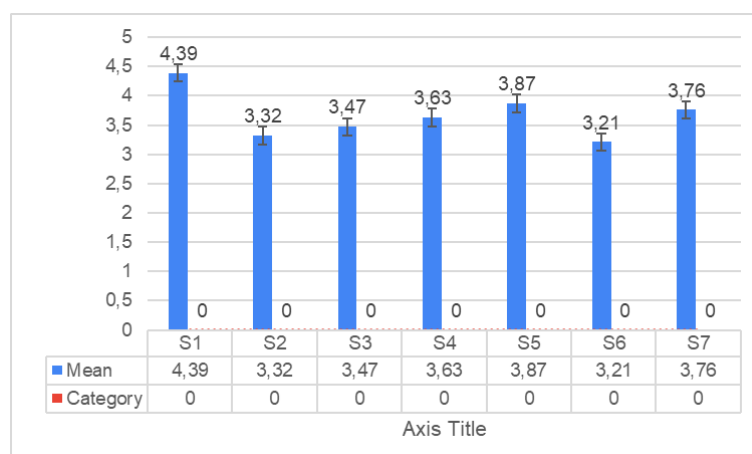


Figure 1. Mean Scores of Teachers’ Scientific Literacy Indicators (S1–S7).

Figure 1 clearly illustrates the variation in mean scores across the scientific literacy indicators. The figure shows that teachers' interest in scientific writing (S1) has the highest mean score, while participation in scientific writing training (S6) records the lowest. This visual pattern is important because it confirms the existence of an intention-action gap, in which teachers demonstrate strong motivation toward scientific activities but have not yet been equally supported by practical experience and formal training opportunities. Therefore, the figure is not only descriptive but also analytically relevant to the central argument of this study.

Qualitative Results

Qualitative data were collected through in-depth interviews with teachers selected as key informants. The thematic analysis yielded several major findings that support and further elucidate the quantitative results. Overall, teachers indicated that educational management support plays a critical role in sustaining scientific writing activities. Most teachers acknowledged that while their motivation to write is high, it is not always accompanied by sufficient opportunities, training, and mentoring. First, teachers emphasized that their interest in scientific writing already exists and has even increased; however, time constraints, workload pressures, and limited access to training remain the primary obstacles. As one teacher stated:

"We actually have a strong desire to write, but we are often constrained by time and are not yet accustomed to scientific writing formats." (G2)

Second, several teachers highlighted the importance of continuous training and mentoring. They noted that training programs conducted in a regular and systematic manner are highly beneficial for improving writing skills, particularly when complemented by direct and sustained mentoring.

"The training is helpful, but its impact would be much greater if there were mentoring support until the work is actually completed." (G5)

Third, teachers perceived that school management support has a substantial influence on the success of scientific literacy development. Forms of support considered effective include the provision of dedicated time for writing, institutional policies that recognize and reward scientific work, and facilitation of access to publication opportunities..

"If the school provides concrete support, such as allocating specific time or giving recognition, we would be much more motivated to write.." (G7)

Overall, the qualitative findings confirm the quantitative results, indicating that teachers' motivation and knowledge are at a relatively high level. However, limitations remain in terms of writing experience and access to training, highlighting the need for stronger and more structured educational management support to sustain and enhance teachers' scientific writing practices.

Discussion

The findings of this study indicate that educational management support plays a significant role in strengthening teachers' scientific literacy and Organizational Citizenship Behavior (OCB). Quantitatively, teachers' interest in scientific activities is categorized as very high; however, their experience in scientific writing and engagement in scholarly activities remains at a moderate level, accompanied by

relatively moderate barriers. This condition reflects an evident intention–action gap, suggesting that teachers’ internal motivation has not been fully translated into concrete actions without adequate managerial system support. These findings align with the argument that organizational structures and school policies are critical determinants in facilitating teachers’ professional engagement (Bismala et al., 2024; Guskey, 2002; Nakidien et al., 2022).

An important finding of this study is the clear gap between teachers’ high interest in scientific writing and their relatively moderate level of actual writing experience and training participation. This deviation suggests that motivation alone is insufficient to produce sustained academic practice. In the Indonesian educational context, such a gap may be explained by several structural and contextual barriers, including limited time allocation, heavy administrative workload, uneven access to mentoring, limited confidence in academic writing, and the absence of a strong school-based research culture. In this sense, teachers may possess the willingness to engage in scientific activities, but they often lack the institutional conditions necessary to translate that willingness into measurable academic output.

To bridge this intention–action gap, school management should adopt more specific and practical strategies. These may include allocating protected time for academic writing, organizing regular scientific writing workshops, establishing peer-review groups and writing clinics, providing sustained mentoring until publication is completed, integrating writing targets into teacher professional development plans, and offering recognition or incentives for academic achievement. In addition, reducing excessive administrative burdens and strengthening collaborative professional learning communities may help create a school environment that supports both scientific literacy and extra-role professional behavior. These strategies are especially relevant in Indonesian schools, where teacher motivation is often present but institutional support remains uneven.

Educational management support has been shown to function as an enabler for the development of teachers’ scientific practices. School management that provides facilities, incentives, mentoring systems, and a collaborative culture enhances teachers’ involvement in scientific activities and continuous professional development. International studies demonstrate that teacher scientific engagement increases significantly when schools establish strong academic governance, effective mentoring systems, and development-oriented management policies (Zhang et al., 2024). Accordingly, the findings of this study reinforce the view that teachers’ scientific literacy is not merely a matter of individual capacity but is also shaped by institutional support mechanisms (Avalos, 2011; Opfer & Pedder, 2011).

In addition to strengthening scientific literacy, educational management support also contributes to the enhancement of teachers’ OCB. Teachers who perceive strong organizational support tend to exhibit higher affective commitment, a stronger sense of belonging to their institutions, and a greater willingness to perform beyond their formal job responsibilities (Kristiani et al., 2019; Lie et al., 2022; Podsakoff et al., 2000). This finding is consistent with organizational behavior theory, which posits that perceived organizational support fosters trust, psychological well-being, and positive teacher engagement in nonformal school activities (Kristiani et al., 2019; Lie et al., 2022). Thus, this study provides empirical evidence that effective educational management influences not only academic outcomes but also organizational behavioral dimensions.

Nevertheless, this study also identifies persistent challenges faced by teachers, including time constraints, administrative workload, and a lack of self-confidence in engaging in scientific activities. These barriers help explain why improvements in scientific literacy do not always correspond with higher levels of publication output or research engagement among teachers. Previous studies similarly report that workload and administrative pressure constitute major obstacles to teachers' participation in scholarly activities (Nwoko et al., 2024). Therefore, educational management support must be not only structural in nature but also adaptive to teachers' working conditions and professional realities.

When compared with previous studies that emphasize the dominance of individual factors in shaping teachers' scientific competence, the present study highlights the substantial contribution of managerial factors. This distinction may be attributed to contemporary educational contexts that increasingly demand clear organizational support systems, particularly in schools undergoing quality improvement initiatives and the strengthening of academic culture. Accordingly, this study enriches the existing literature by emphasizing that teachers' scientific literacy emerges from the interaction between personal factors and educational organizational systems.

From a theoretical perspective, the findings reinforce the understanding that modern educational management must evolve from an administrative function toward a strategic role oriented to capacity building among teachers. Management support should extend beyond the provision of facilities to encompass transformational leadership, professional mentoring, and the cultivation of a strong scientific culture within schools. This perspective aligns with evidence indicating that visionary and supportive leadership enhances teacher innovation and engagement in scientific and collaborative activities (Roesminingsih & Windasari, 2025).

The practical implications of this study underscore the need for school policies that explicitly integrate programs aimed at strengthening teachers' scientific literacy with the development of positive organizational behaviors (Sims et al., 2025). Schools are encouraged to build a conducive academic ecosystem through sustained scientific training programs, the establishment of professional learning communities, recognition and reward systems, and collaborative governance structures, as these elements have been shown to enhance teachers' professional engagement and organizational commitment (Sullanmaa et al., 2024). Moreover, educational management should reduce administrative burdens to provide teachers with greater opportunities for academic growth.

At the policy level, these findings carry important implications for the Indonesian education system. Strengthening teachers' scientific literacy should not be treated solely as an individual responsibility, but as part of a broader educational management agenda supported by schools, local education authorities, and professional development institutions. Policies that integrate mentoring systems, structured academic training, institutional recognition, and reduced administrative overload may help build a more sustainable academic culture among teachers. Such policy support is likely to strengthen not only teacher professionalism but also school effectiveness, innovation, and long-term educational quality in Indonesia.

This study also opens avenues for future research. Subsequent studies may expand the geographical scope of investigation and employ longitudinal designs to examine changes in teachers' behaviors over time, particularly in relation to professional

learning and organizational citizenship behavior (Somech & Ron, 2007). Furthermore, the integration of mixed methods approaches is recommended to explore deeper psychological and social dynamics underlying teachers' scientific engagement and extra-role behaviors (Cresswell & Plano Clark, 2011; Creswell & Vicki L, 2023). Comparative studies across regions or educational levels are also recommended to provide a more comprehensive understanding of the relationships among educational management support, scientific literacy, and teachers' OCB.

Although teachers demonstrated relatively positive Organizational Citizenship Behavior, their scientific writing experience remained moderate. This contrast suggests that teachers may already possess strong organizational commitment and willingness to contribute beyond formal responsibilities; however, such positive organizational behavior does not automatically translate into academic productivity without sufficient institutional facilitation, structured training, and continuous mentoring.

In conclusion, this study offers both empirical and theoretical contributions by demonstrating that educational management support is a crucial factor in strengthening teachers' scientific literacy and fostering positive organizational citizenship behavior. These findings affirm that efforts to enhance educational quality cannot be separated from the effectiveness of educational governance and organizational commitment to teachers' professional development.

CONCLUSION

This study demonstrates that educational management support plays a strategic and decisive role in strengthening teachers' scientific literacy while simultaneously fostering positive Organizational Citizenship Behavior (OCB). The findings indicate that although teachers' interest in scientific activities is very high, the effective realization of such interest into actual academic practice depends heavily on systematic managerial support through structured policies, continuous professional development, mentoring systems, collaborative school cultures, and a supportive organizational climate. These results confirm that educational management should move beyond purely administrative functions toward a more transformational and capacity-building role that directly supports teacher professionalism and organizational commitment.

The study also highlights the strategic relevance of these findings for Indonesian education. Strengthening teachers' scientific literacy through school management support may contribute not only to individual teacher development but also to improved school effectiveness, collaborative culture, and the broader quality of education. Therefore, policies and school-level programs that support academic writing, mentoring, and professional recognition should be considered important components of educational improvement in Indonesia.

Nevertheless, this study has several limitations. First, the number of participants was relatively limited, which may affect the generalizability of the findings. Second, the study employed a cross-sectional design, which does not fully capture changes in teacher behavior over time. Third, the data relied largely on self-reported responses, which may be influenced by subjective perceptions. In addition, this study did not examine other potentially influential factors such as school culture, teacher self-efficacy, transformational leadership, and psychological well-being in greater depth.

Accordingly, future research is recommended to involve larger and more diverse samples across wider geographical areas, apply longitudinal designs, and examine

additional variables that may mediate or moderate the relationship between educational management support, scientific literacy, and OCB. Comparative studies across school levels or regions are also suggested in order to provide a more comprehensive understanding of how organizational and contextual factors shape teachers' academic engagement and professional behavior.

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