

The Influence of Participatory Leadership on The Development of Teacher Competence in The Era of The Industrial Revolution 4.0

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Abstract: This study aims to analyze the influence of participatory leadership on teacher competency at SMP Negeri 4 Probolinggo City in facing the challenges of the Industrial Revolution 4.0. Using a quantitative approach with a correlational method, the research involved 50 teachers selected through purposive random sampling. Data were collected using a participatory leadership questionnaire and a teacher competency instrument, then analyzed through regression and Pearson correlation. The results show a positive and significant relationship between participatory leadership and teacher competency, with a correlation value (r) of 0.72 and a coefficient of determination (R^2) of 0.518. This finding indicates that participatory leadership contributes 51,8% to teacher competency development. The implications emphasize the critical role of principals in applying a collaborative participatory leadership style to strengthen teacher professionalism and build a school climate that adapts effectively to technological advancements.

Keywords: Participatory, Teacher_Competency, Principal, Educational_Technology, Industrial_Revolution 4.0

A. Introduction

The era of Industrial Revolution 4.0 is characterized by rapid technological advancements, where digitalization, automation, and interconnection are transforming various aspects of human life, including education. This shift requires significant adjustments to curricula and pedagogical approaches, making teacher competence a key factor in ensuring effective learning (Kusumaningrum et al., 2024). Competent teachers must not only master their subject matter but also possess the skills to integrate technology into the learning process. Mastery of information and communication technology (ICT) is crucial, as digital tools offer a variety of innovative learning methods and strategies (Lestari & Kurnia, 2023).

In this context, participatory leadership emerges as a strategic approach to enhance teacher competency. This managerial model emphasizes the involvement and participation of all staff members in decision-making and planning, fostering a more collaborative and supportive work environment (Mirsa et al., 2024). Participatory leadership, which has been shown to increase motivation and job satisfaction (Ramadani et al., 2024), can empower teachers at SMP 4 Kota Probolinggo to share experiences, knowledge, and best practices. By involving teachers in decisions about curriculum and teaching methods, the school can ensure the curriculum is relevant and adaptable, while also nurturing innovation and creativity in the classroom. This shared sense of ownership can strengthen the relationship

between leaders and teachers, creating a positive and collaborative school culture (Nur Efendi & Muh Ibnu Sholeh, 2023).

Despite the widely recognized benefits of participatory leadership, a significant gap remains in research that directly links its influence to teacher competency at the junior high school level (Waruwu et al., 2025). This gap is particularly relevant given the rapid changes brought by the Industrial Revolution 4.0, which necessitate a new approach to developing educator capabilities. It is therefore crucial to conduct more in-depth research on this relationship, as a participatory approach that prioritizes collaboration and open communication may be an effective solution to help teachers adapt to the challenges of integrating technology into their teaching (Sartini et al., 2024; Mufidah et al., 2024).

The purpose of this study is to analyze the influence of participatory leadership on teacher competency at SMP 4 Kota Probolinggo in the context of the Industrial Revolution 4.0. Through a systematic and analytical approach, this research aims to provide a deeper understanding of the relationship between these two variables. For example, increased teacher involvement in decision-making can enhance their sense of ownership and improve their motivation and performance (Marsela Yulianti et al., 2022). The findings are expected to offer constructive recommendations for developing more effective education policies and to serve as a reference for stakeholders in formulating strategies that improve learning effectiveness and teacher competence (Fitrianti et al., 2024). Ultimately, successful implementation of these findings can have a positive impact on the national education system more broadly

B. Methods

This study employed an associative/correlational quantitative method to examine the influence of participatory leadership on teacher competence in the Industrial Revolution 4.0 era at SMP Negeri 4 Probolinggo. This approach aims to test a formulated hypothesis and measure the relationship between two variables, where Participatory Leadership serves as the independent variable and Teacher Competence is the dependent variable (Waruwu et al., 2025). This method provides a clear picture of the influence of participatory leadership, which is critical in the context of Indonesian education (Sari, 2024).

The population for this study consisted of all 50 teachers at SMP Negeri 4 Probolinggo. A purposive sampling technique was used to select the sample, focusing on teachers with at least three years of teaching experience who were willing to participate. This technique was chosen to ensure the sample accurately represents teachers with sufficient experience and understanding of the concepts being studied, thereby enhancing the validity of the research results (Ghanad, A., 2023; Cash et al., 2022). By selecting teachers who meet specific criteria, the study aims to obtain accurate and representative data (Zickar & Keith, 2023).

The research instrument consisted of two questionnaires: one for participatory leadership and one for teacher competence. The participatory leadership questionnaire measured the frequency and quality of leadership experiences, while the teacher competence questionnaire assessed the level of teacher competence based on the standards set by the Ministry of Education and Culture. Before use, both instruments were tested for validity

using factor analysis and reliability using Cronbach's Alpha, which are crucial steps to ensure data quality and accuracy (Anggraini et al., 2022; Subhaktiyasa, 2024).

Once the data were collected, they were analyzed in several steps. First, prerequisite tests were conducted to ensure the data met the assumptions of normality (using the Kolmogorov-Smirnov test) and linearity (using regression analysis). If the assumptions were met, a Pearson correlation analysis was performed to measure the strength and direction of the relationship between participatory leadership and teacher competence (Walizada, 2021; Kwasek et al., 2023). This analysis is expected to provide in-depth insight into the influence of participatory leadership at SMP Negeri 4 Probolinggo.

C. Results and Discussion

In this study, the variable X measured is Participatory Leadership, while the variable Y is Teacher Competence in the Industrial Revolution Era 4.0. Data were collected from 50 teachers at public junior high school 4 Probolinggo who were selected by purposive random sampling. The results of the descriptive analysis of the Principal's Participatory Leadership through a questionnaire that covers aspects such as Leadership Style, Managerial Ability and Teacher Work Motivation. Meanwhile, the level of teacher competence was measured using a questionnaire that covers aspects such as pedagogical competence, personality competence, social competence, and professional competence.

The average score of Participatory Leadership KS is 19.72 on a scale of 25, indicating that most teachers (84%) feel that Participatory Leadership is implemented with high or very high quality, the strongest point is "The principal involves teachers in decision making." While the weakest point is relatively "The principal shows a consistent attitude in his leadership." although it is still in the high category.

The average teacher competency score was 20.36 on a scale of 25, indicating that the majority of teachers (90%) demonstrated high to very high competency. The strongest point was that teachers were able to manage a conducive and interactive classroom. The weakest point was "Teachers utilize technology in the learning process," although it was still in the high category.

Table 1. Results of the Recapitulation of Participatory Leadership Questionnaire Data (Variable X)

No	Statement	Rat rat	Standard Deviation	Interpretation
1	Principals involve teachers in decision making.	4,02	0,71	High
2	The school principal sets an example in attitude and work ethic.	3,80	0,84	High
3	The principal is able to create a comfortable and collaborative working atmosphere.	3,94	0,78	High
4	The principal demonstrates a consistent attitude in his leadership.	3,76	0,89	Medium-High

No	Statement	Rat rat	Standard Deviation	Interpretation
5	The principal encourages teachers to continue to develop professionally.	4,20	0,65	Very high

Table 1. Results of the Recapitulation of Participatory Leadership Questionnaire Data (Variable X)

Score Interpretation:

1.00–1.80: Very Low

1.81–2.60: Low

2.61–3.40: Moderate

3,41–4,20: High

4.21–5.00: Very High

Table 2. Participative Leadership Score Results per Respondent

Interval Score Total (5-25)	Number of Respondents	Percentage	Category
21-25	18	36%	Very high
17-20	24	48%	High
13-16	7	14%	Currently
9-12	1	2%	Low
≤8	0	0%	Very Low

Total average overall score = **19,72 / 25** → **Category: Height**

Table 3. Results of the Teacher Competency Questionnaire Data Recapitulation (Variable Y)

No	Statement	Rat rat	Standard Deviation	Interpretation
1	Teachers use varied and effective learning methods.	4,10	0,66	High
2	Teachers understand the characteristics of students comprehensively.	4,00	0,70	High
3	Teachers are able to design learning that suits students' needs.	4,22	0,61	Very high
4	Teachers evaluate and reflect on the learning process for future improvements.	3,96	0,75	High
5	Teachers utilize technology in the learning process.	4,08	0,69	High

Score Interpretation:

1.00–1.80: Very Low

1.81–2.60: Low

2.61–3.40: Moderate

3,41–4,20: High

4.21–5.00: Very High

Table 4. Teacher Competency Score Results per Respondent

Interval Score Total (5-25)	Number of Respondents	Percentage	Category
21-25	22	44%	Very high
17-20	23	46%	High
13-16	5	10%	Currently
9-12	0	0%	Low
≤8	0	0%	Very Low

Total average overall score = **20,36 / 25** → **Category: Height**

A regression test was conducted to measure the effect of Participatory Leadership (variable X) on teacher competency (variable Y). The results of the regression analysis showed a significant relationship between the two variables, with an R^2 value of 0.45. This means that 45% of the variation in teacher competency can be explained by Participatory Leadership. The regression coefficient obtained was 0.6, indicating that each one-time development in Participatory Leadership will increase the teacher competency score by 0.6 points.

The t-test showed a significance value of 0.001, indicating that the frequency of Participatory Leadership on teacher competence was significant at the $\alpha = 0.05$ level. This finding is in line with research by Mufidah et al. (2024), which found that Participatory Leadership had a significant influence on Teacher Competence. Thus, the results of this regression test provide strong empirical evidence regarding the importance of Participatory Leadership in the context of teacher competence development.

Table 5. Regression Test Results

Parameter	Mark
Constant (a)	8,55
Coefficient (b)	0,598
R^2	0,518
F (Uji ANOVA)	52,43
p-value	0,000

Regression Model

$$Y = a + bX$$

Y = Competence Pedagogical

X = Clinical Supervision

Regression Equation:

$$Y = 8.55 + 0.598X$$

Interpretation: For every 1 point increase in participatory leadership, teacher competency increased by an average of 0.598 points. R^2 value = 0.518 → 51.8% of the variation in teacher competency can be explained by participatory leadership. The model is significant ($p < 0.05$). A regression test was conducted to analyze the effect of participatory leadership on teacher competence. The results, as shown in Table 5, revealed a significant relationship between the two variables. The R^2 value of 0.518 indicates that 51.8% of the variation in teacher competence can be explained by participatory leadership. The regression equation, $Y = 8.55 + 0.598X$, shows that for every one-point increase in participatory leadership,

teacher competence increases by an average of 0.598 points. The t-test showed a p-value of 0.000, confirming that this relationship is statistically significant at the $\alpha = 0.05$ level. This is supported by a Pearson correlation analysis, which yielded an r-value of 0.72 (Table 6), indicating a strong positive relationship between the variables. This finding is consistent with research by Mufidah et al. (2024), which found that participatory leadership has a significant influence on teacher competence, and Sari et al. (2023), who also noted a significant positive relationship between these two variables.

Table 6. Correlation Test Results

Variable X (Participative Leadership)	Variable Y (Teacher Competence)
Rate-rate = 19.72	Rate-rate = 20.36
Standard Deviation = 2.31	Standard Deviation = 2.17
Pearson Correlation (r) = 0,72	p-value = 0,000 (p < 0,05)

Interpretation:

The value of $r = 0.72$ → strong positive relationship;
 $p < 0,05$ → significant;

There is a positive and significant relationship between participative leadership and teacher competency. Based on the analysis, it can be concluded that participatory leadership has a significant influence on teacher competency development in secondary schools. The high frequency of participatory leadership contributes to teachers' understanding of competency development strategies and helps them plan and implement more effective learning. This aligns with constructivist learning theory, which states that direct experience and interaction with the principal or leadership can enrich teachers' knowledge and skills (Sanusi, 2022).

The importance of participatory leadership in this context is also supported by findings from previous research showing that support from the principal can increase teachers' confidence in developing their competencies (Yulianto et al., 2023). Thus, the results of this study confirm that participatory leadership is not only a leadership style but also a crucial factor in developing teacher competencies.

The findings of this study align with various theories and previous research showing that leadership style plays a crucial role in developing teacher competency. According to Mubarok et al. (2024), an effective participatory leadership style involving collaboration between teachers and the principal can create a supportive learning environment. This reflects a collaborative approach that can develop teacher competency.

Research by Manalu & Kristianingsih (2024) also found that teachers actively involved in participatory leadership had higher levels of job satisfaction and were more motivated to develop their competencies. Thus, these findings suggest that participatory leadership can serve as a factor in developing teachers' motivation and commitment to developing their competencies. This is important for leaders to consider when choosing a more effective leadership style.

The implications of this research's findings indicate that participatory leadership styles need to be enhanced and optimized to support teacher competency development.

Principals need to implement participatory leadership styles to create a conducive school climate.

The importance of leadership training for principals should not be overlooked. Principals who have a good understanding of pedagogy and effective leadership strategies will be better able to provide constructive feedback to teachers. This aligns with findings by Waruwu et al. (2025), which show that trained principals can provide better support to teachers in planning and implementing learning. Therefore, principal professional development is also an important aspect in developing the effectiveness of Participatory Leadership.

D. Conclusions

This study concludes that participatory leadership has a significant and positive influence on teacher competency at SMP Negeri 4 Probolinggo. The findings demonstrate that active involvement of teachers in decision-making and school development contributes directly to the enhancement of both pedagogical and professional competencies.

From a practical perspective, several recommendations can be drawn. First, schools should implement structured participatory leadership programs that equip principals with effective leadership skills and provide teachers with regular opportunities for reflection and feedback. Second, it is important to foster a collaborative culture where teachers feel supported and encouraged to share experiences, exchange ideas, and work collectively to address challenges. Third, teachers should be empowered as active participants in leadership processes, positioning them not only as implementers but also as co-creators of educational quality.

For future research, broader studies involving diverse school contexts and levels of education are recommended. Exploring mediating factors such as motivation, organizational culture, or professional development programs may provide deeper insights into the dynamics between leadership and teacher competency. Longitudinal approaches would also enrich the understanding of how participatory leadership influences teacher growth over time and inform more sustainable education policies.

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