

INFLUENCE OF LEARNING COMMUNITIES THROUGH DEEP LEARNING STRATEGIES TO IMPROVE TEACHER COMPETENCE AND PERFORMANCE

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ARTICLE HISTORY

Received : 20-04-2026

Revised : 07-05-2026

Accepted : 15-06-2026

KEYWORDS

*Deep Learning,
Learning
Community,
Teacher
Competence,
Teacher
Performance*

ABSTRACT

This study aims to examine the influence of learning community activities with a deep learning approach on improving teacher competence and performance as well as the correlation between competence and teacher performance. The study used a quantitative method with a quasi-experimental design involving the experimental group and the control group. Data collection techniques include questionnaires, documentation, and observations. Data analysis included statistical tests of normality, homogeneity, t-test, and Pearson correlation test. The results of the prerequisite test showed that the data had a normal distribution and were homogeneous, making them eligible for parametric analysis. The results of the independent sample t-test showed a significance value of 0.001 ($p < 0.05$) with a mean difference of 10.083, which indicates a significant difference between the two groups, where the experimental group obtained a higher score than the control group. In addition, the Pearson correlation test produced a significance value of 0.002 with a correlation coefficient of 0.781 which is included in the strong and positive categories, thus showing a close relationship between competence and teacher performance. These results reinforce that the implementation of deep learning-based learning communities is able to improve competence while having an impact on significantly improving teacher performance. The results of this study imply that schools need to implement a deep learning-based learning community on an ongoing basis to improve teacher competence and performance.

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INTRODUCTION

Improving the quality of basic education is highly determined by the performance and competence of teachers as the main actors in the learning process. Elementary school teachers are not only required to master teaching materials, but also demonstrate professional competencies that are relevant to the demands of 21st century education in order to be able to organize effective, meaningful, and development-oriented learning for the full potential of students. To answer these challenges, the Indonesian government through the Kemendikbudristek (2022) places the deep learning approach as one of the education strategies that is being promoted. Deep learning is understood as an approach that emphasizes a deep and meaningful, inclusive learning process (mindful learning, meaningful learning, and joyful learning) so that students do not just memorize information, but understand, relate the material to real life, and are able to think critically and creatively in the context of learning and daily life. The deep learning approach also aims to develop 21st-century competencies such as critical thinking, creativity, communication, and collaboration which are basic needs of education today. However, the implementation of deep learning in the field still faces various challenges. Teachers focus on formative learning practices and are oriented towards achieving curriculum targets only, while in-depth understanding and practice of learning are still limited. According to Atmojo et al. (2025) explains that the limitations of teachers' professional competence in designing, managing, and evaluating learning that prioritize students' complex thinking processes, as well as the limitations of continuous professional support for teachers. One approach that is considered effective to answer these challenges is through the teacher learning community. The teacher learning community is a collaborative forum where teachers can share experiences, good practices, teaching strategies, and reflect on the learning carried out. According to Timur et al. (2025) explained through the learning community, teachers are not only involved in theoretical discussions, but also develop their professional practices in an ongoing manner. Studies show that active involvement in learning communities contributes positively to the improvement of teacher competence, including pedagogical skills, motivation, and self-confidence in learning practice. Furthermore, previous research has revealed that learning communities play an important role in providing space for teachers to support each other and encourage improvement of learning practices, which can ultimately improve the effectiveness of the implementation of their professional duties in schools. The pedagogical deep learning approach in the learning community encourages teachers to learn collaboratively through reflection, exchange of teaching experiences, and joint learning problem-solving. However, there are still few empirical studies in Indonesia that discuss the influence of teacher collaboration in the deep learning-based learning community on improving teacher competence and performance, especially at the elementary school level.

These findings are consistent with the concept of Professional Learning Community (PLC) which is empirically proven to improve teachers' professional competence and practice in various elementary school contexts (Mydin et al., 2024). In the context of the implementation of the deep learning approach, involvement in the learning community is considered to have a strategic role because this approach requires a change in the learning paradigm that is complex, collaborative, and reflection-based. Teachers who are active in learning communities have a greater opportunity to understand deep learning concepts, develop innovative pedagogical skills, and improve learning practices through interaction and reflection with peers. Although conceptually the learning community is able to contribute to improving teacher competence and performance, empirical studies that specifically examine the influence of learning communities through deep learning approaches on improving the competence and performance of elementary school teachers are still limited. Therefore, this research is important to provide empirical evidence on the extent to which learning communities can be a forum for improving teachers' competence and performance in implementing deep learning approaches in elementary schools. The purpose of the study was to determine the influence of the learning community on deep learning on teacher competence and performance and the correlation between teacher competence and teacher performance

METHOD

This research used a quantitative approach with a quasi-experimental design. This approach was chosen because the data collected is numerical and analyzed using statistical methods. This study also examines the relationship and influence between the independent and dependent variables. The independent variable is the learning community, while the dependent variable is the teacher's competence and teacher performance. The population in this study was all teachers in the Ki Hajar Dewantara, Kembaran, Banyumas area, who have learning communities in their schools. The sample selection in this study used a purposive sampling technique, because the determination of the selected sample had certain considerations, namely teachers who were active in schools and participated in Ki Hajar Dewantara learning community activities.

The data collection techniques used are questionnaire, documentation, and observation. The main instrument of the research was a questionnaire with a Likert scale of 1-5 given to teachers in the Ki Hajar Dewantara. The questionnaire was chosen because it can collect a large amount of data, is relatively efficient, and is appropriate to measure respondents' attitudes, perceptions, and views regarding the effectiveness of the learning community, teacher competence, and teacher performance. Documentation techniques to obtain secondary data, such as the number of teachers, the organizational structure of the cluster, the schedule of the implementation of the learning community, and other relevant supporting documents. This technique is used to reinforce the primary data obtained through questionnaires. Researchers can also make limited observations of the implementation of the learning community to get a real picture of teacher involvement, the atmosphere of the activity, and the collaborative activities that take place. Observations were carried out as supporting data to validate the questionnaire answers. Before the research instrument is used, a validity and reliability test is carried out.

Table 1. Validity and Reliability Tests

Instruments	KSE Questionnaire	Category
Validation Test	$r_{hit} = 0.533 > r_{table} = 0.432$	Valid
Reliability Test	Cronbach Alpha Values = 0.743 > 0.60	Reliable

Source: SPSS Output, 2026

Table 1 explains that the questionnaire instrument meets the validity criteria, namely $r_{hit} > r_{table}$. In addition, the instrument also meets the reliability criteria, namely the Cronbach Alpha value > 0.60 . In addition to using statistical validity, the questionnaire validity test was also tested by experts. The expert criteria involved included learning evaluation experts, active research in school curriculum studies, and active activities in schools that promote the Independent Learning curriculum. Based on the validity results, the questionnaire instrument showed valid aspects according to the experts. Thus, the questionnaire instrument meets the valid and reliable aspects for use in research.

The data obtained from the questionnaire was processed to determine the frequency distribution, mean value, percentage, and category (high, medium, low). This analysis aims to provide an overview of the implementation of the learning community, teacher competence, and teacher performance in the Ki Hajar Dewantara. Statistical tests apply the help of SPSS applications which consist of normality tests, homogeneity tests, t tests, and correlation tests

Result And Discussion

This research was conducted in the Ki Hajar Dewantara Cluster of Korwilcam Dindik Kembaran, Banyumas Regency with subjects of 12 teachers of SDN Kembaran as an experimental class and 6 teachers of SDN 1 Lingasari as a control class. Berikut will be presented with the results of the research and its discussion

Result

This study applied the Kolmogorov Smirnov and Shapiro Wilk test to test the normality of the data. The data is said to be normally distributed if the value of sig. greater than 0.05 ($\text{sig} > 0.05$) and not normally distributed if the value of sig. less than 0.05 ($\text{sig} < 0.05$). Table 2 presents the results of the normality test

Table 2. Normality Test Results

		Kolmogorov-Smirnov ^a			Shapiro-Wilk		
KELOMPOK		Statistic	df	Sig.	Statistic	df	Sig.
KOM_PRE	EKSPERIMEN	.119	12	.200 [*]	.971	12	.924
	KONTROL	.122	6	.200 [*]	.982	6	.961
KOM_POST	EKSPERIMEN	.146	12	.200 [*]	.964	12	.837
	KONTROL	.183	6	.200 [*]	.960	6	.820
KIN_PRE	EKSPERIMEN	.145	12	.200 [*]	.950	12	.641
	KONTROL	.223	6	.200 [*]	.908	6	.421
KIN_POST	EKSPERIMEN	.127	12	.200 [*]	.955	12	.708
	KONTROL	.183	6	.200 [*]	.960	6	.820

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Source: SPSS Output, 2026

Based on table 2, the significance value of the Shapiro-Wilk test for each pre-test and post-test results was more than 0.05. Thus, the data on the competence and performance of the respective teachers are distributed normally. The next test is the homogeneity test which will be shown by table 3.

Table 3. Homogeneity Test Results

		Test of Homogeneity of Variance			
		Levene Statistic	df1	df2	Sig.
KOM_PRE	Based on Mean	.220	1	16	.645
	Based on Median	.219	1	16	.646
	Based on Median and with adjusted df	.219	1	15.377	.646
	Based on trimmed mean	.220	1	16	.645
KOM_POST	Based on Mean	4.683	1	16	.046
	Based on Median	4.571	1	16	.048
	Based on Median and with adjusted df	4.571	1	13.118	.052
	Based on trimmed mean	4.682	1	16	.046
KIN_PRE	Based on Mean	1.006	1	16	.331
	Based on Median	.849	1	16	.370
	Based on Median and with adjusted df	.849	1	15.343	.371
	Based on trimmed mean	1.016	1	16	.328
KIN_POST	Based on Mean	2.959	1	16	.105
	Based on Median	2.939	1	16	.106
	Based on Median and with adjusted df	2.939	1	13.411	.109
	Based on trimmed mean	2.953	1	16	.105

Source: SPSS Output, 2026

Based on table 3, the significance value in the based on mean section exceeds 0.05. It can be said that the data on teacher performance and teacher competence reaches the homogeneous category. Further testing is continued on the statistical test of the t test.

Table 4. Independent Sample T Test Results

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
KOM_POST	Equal variances assumed	4.683	.046	11.364	16	<.001	10.833	.953	8.812	12.854
	Equal variances not assumed			14.196	16.000	<.001	10.833	.763	9.216	12.451
KIN_POST	Equal variances assumed	2.959	.105	11.840	16	<.001	10.083	.852	8.278	11.889
	Equal variances not assumed			14.356	15.744	<.001	10.083	.702	8.592	11.574

Source: SPSS Output, 2026

Based on table 4, the results of the t-test using SPSS, a significance value (Sig. 2-tailed) of < 0.001 (< 0.05) were obtained, so it can be concluded that there was a significant difference between the experimental group and the control group. The mean difference value of 10,083 showed that the average score in the experimental group was higher than in the control group. Thus, treatment in the form of learning community activities through a deep learning approach has a positive effect on improving teacher competence and performance. Cohen's effect size value of d of 5.36 is included in the very large category, so it can be concluded that learning community activities with a deep learning approach have a very strong influence on improving teacher competence and performance. The next test was carried out to determine the correlation between teacher performance and teacher competence in implementing learning with deep learning strategies. Table 5 presents data on the results of the Pearson correlation test.

Table 5. Correlation Test Results Between Teacher Performance and Teacher Competence

	Aspect	Teacher Performance	Teacher Competence
Teacher Performance	Pearson Correlation	1	0.781
	Sig. (2-tailed)		0.002
	N	20	20
Teacher Competence	Pearson Correlation	0.781	1
	Sig. (2-tailed)	0.002	
	N	20	20

Source: SPSS Output, 2026

Based on table 5, the results of the Pearson correlation test for teacher performance and teacher competence were obtained. The correlation between teacher performance and teacher competence was obtained with a significance value of 0.002, meaning less than 0.05. The Pearson correlation value shows a value of 0.781, meaning it has a strong

correlation rate. It was concluded that there was a positive correlation with a strong correlation between teacher performance and teacher competence. The same results were also obtained for the correlation between teacher competence and teacher performance, which showed a strong correlation level.

Discussion

Based on the results of the statistical test analysis, it was obtained that the significance value of the Shapiro-Wilk test in the pre-test and post-test data was above 0.05, so it can be concluded that the teacher competency and performance data have met the normal distribution assumption. This shows that the data is feasible for use in parametric statistical analysis because it does not deviate from the normal distribution (Muliana et al., 2025; Rahmawati & Nurfitriana, 2023). Furthermore, in Table 2, it is known that the significance value of the homogeneity test using Levene's Test in the based on mean part is also greater than 0.05, which indicates that the variance between data groups is homogeneous or uniform (Aminah et al., 2023; Nurlaela & Rijanto, 2022). Thus, the two prerequisite assumptions of the analysis, namely normality and homogeneity, have been met, so that the data on teacher performance and competence can be further analyzed using parametric tests and the results can be trusted and interpreted appropriately (Faisol & Caesarita, 2025; Adnan & Riyana, 2024).

The results of the other analysis also obtained a significance value (sig. 2-tailed) that was smaller than 0.05, i.e. < 0.001 , indicating a significant difference between the experimental group and the control group. The mean difference value of 10.083 indicates that the average score in the experimental group is higher than in the control group, which means that the treatment given has a real effect. These results are in line with various previous studies that state that the application of the deep learning approach is able to provide a significant increase in competence and performance compared to conventional learning (Dewi & Rusilowati, 2025; Dahroni et al., 2025). In addition, other studies have also revealed that deep learning plays a role in improving teachers' pedagogic competence as well as critical thinking skills and professional performance (Latifah et al., 2025; Nursukowati et al., 2025). Thus, the results of this significant t-test further strengthen that deep learning-based learning community activities are effective in creating more meaningful, collaborative, and reflective learning, thus having a positive impact on improving teacher competence and performance (Julkifli & Syamratulangi, 2025; Baadilla et al., 2025).

A pedagogical deep learning approach combined with a learning community is able to improve teacher competence because the learning process not only focuses on material transfer, but also on deep reflection, real problem solving, collaboration, and continuous improvement of teaching practices. Improving teacher competence in deep learning-based learning communities occurs through several key collaboration mechanisms. First, reflective practice or joint reflection allows teachers to analyze learning successes and obstacles so that continuous improvement of teaching practices is created. Kallio (2024) explained that collaborative reflection in the professional community encourages teachers to understand deeper learning practices in a more complex and applicable way. Second, peer coaching and peer observation provide teachers with the opportunity to obtain direct feedback on the learning strategies used. Chen et al. (2023) stated that the peer coaching mechanism in the professional learning community is effective in improving pedagogical abilities because teachers learn from the real practice of their peers. Third, collaboration in the form of collaborative inquiry allows teachers to jointly find solutions to learning challenges in the classroom. DeLuca et al. (2015) emphasized that collaborative inquiry is an important structure in teacher professional development because it can strengthen pedagogic skills and the quality of student learning. Fourth, the sharing of learning resources and teaching experiences creates a professional learning culture that supports continuous competency improvement. Kanawapee et al. (2022) stated that a culture of sharing, caring, and collaboration in the learning community can strengthen teacher competence and increase professional motivation. Research by Liu et al. (2024) shows that professional learning communities are able to strengthen the integration of innovative learning practices through collaboration and continuous professional development. Setiyowati et al. (2025) explained that teachers' pedagogic competence will develop more optimally if the learning community is focused on collaborative planning, peer observation, and deep learning-based learning reflection.

In addition, the significance value of the Pearson correlation test was obtained of 0.002 which was smaller than 0.05, thus showing a significant relationship between teacher competence and teacher performance. The value of the Pearson correlation coefficient of 0.781 indicates that the relationship is in the strong and positive category, which means that the improvement of teacher competence is followed by the improvement of teacher performance. These results are in line with the findings of previous research which stated that teacher competence has a positive and significant relationship with performance, both in pedagogic and professional aspects (Kumala & Bafadal, 2018; Damanik, 2019). In addition, other research also shows that the higher the competence of teachers, the better the quality of performance shown in the learning process (Rahmawati et al., 2021; Supriyanto, 2023). Some studies even reveal that the level of relationship between competence and teacher performance is in the medium to strong category, thus emphasizing the close relationship between the two variables (Ahmad & Walid, 2022; Immah et al., 2020). Thus, the results of this study confirm that teacher competence is an important factor that plays a role in improving performance, so competency development needs to be continuously improved to support better quality education.

Conclusion

Based on the overall results of the study, it can be stated that learning community activities with a deep learning approach have a positive and significant influence on improving teacher competence and performance. This can be seen from the results of the difference test which showed a marked improvement in the experimental group compared to the control group, and supported by the Pearson correlation test which showed a positive relationship with a high level of strength between competence and teacher performance. These findings show that the increase in teacher competence is directly proportional to the increase in their performance. The implications of the findings show that schools need to implement a deep learning-based learning community on an ongoing basis as an effort to improve teacher competence which further has an impact on improving teacher performance in schools.

This study has limitations in the number of samples and the scope of research is still limited, and only examines the variables of teacher competence and performance without considering other factors such as work motivation, principal's leadership, and organizational culture. Therefore, further research is recommended to involve a larger number of respondents and a wider area coverage, as well as to use a mixed methods approach to make the results more comprehensive. The next study can also add other relevant variables and examine the application of deep learning in the long term to determine the sustainability of its influence on improving teacher professionalism.

Acknowledgment

The researcher expressed his gratitude to the Postgraduate, University of Muhammadiyah Purwokerto for supporting so that the research ran smoothly and well.

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