



# IMPROVING TEACHERS' PEDAGOGICAL COMPETENCE IN ESTABLISHING DEEP LEARNING MODELS THROUGH WORKSHOPS AT SD NEGERI KOTALAMA 3

Vadhika Ayurani Dinata, Achmad Supriyanto\*

State University of Malang, Jl. Semarang No. 5 Malang, East Java, Indonesia

\*Author of correspondence, Email: [vadhika.ayurani.2301316@students.um.ac.id](mailto:vadhika.ayurani.2301316@students.um.ac.id),  
[a.supriyanto.fip@um.ac.id](mailto:a.supriyanto.fip@um.ac.id)

## Abstract

This study aims to explore the improvement of pedagogical competence and teachers' self-development by conducting a deep learning program through workshop activities in public primary schools. This research adopted a qualitative approach with a case study type. Data collection was conducted using three methods, namely interviews, observations, and documentation studies. The data analysis process starts from data collection, data presentation, data condensation, and conclusion drawing. To ensure the validity of the data in the study using data triangulation techniques. Based on the review of the information that has been organized, the following research findings are obtained: (1) The implementation of the workshop model which is held regularly every new school year, (2) The plan for implementing the deep learning model, (3) The impact of the workshop in improving teachers' pedagogical competence, (4) The role of the workshop model in improving teachers' pedagogical competence, (5) The resources needed in improving teacher performance, and (6) The challenges and solutions faced during the workshop activities.

**Keywords:** Workshop; Teacher pedagogics; Deep learning

## 1. Introduction

Education in Indonesia is currently undergoing a period of transformation to address all the challenges of the 21st century through creativity, critical thinking, and collaborative capacity, which are key elements in education to prepare the younger generation to be capable and ready to face global challenges. (Putri, 2024). Human resource development plays a very important role in implementing each of the necessary elements. The most important resource needed to ensure that the learning process is successful and that educational standards are met is teachers. (Manora et al., 2024). Education cannot be separated from the crucial role played by teachers. The primary responsibilities of teachers include educating, teaching, guiding, directing, training, and assessing students. In addition, a teacher must also have the ability to make the right decisions in determining planned and systematic assessment results during learning. (Husny, 2021).

Teachers are a crucial resource in ensuring the success of students in their educational process and the quality of their education. The teaching methods they use also determine whether students succeed or fail in various learning activities (Manora et al., 2024). Rezaldi (2021) highlights the importance of enhancing teachers' skills and quality in the digital age, emphasizing that creating an effective learning process requires strategic development of teachers' capabilities. A teacher's ability to compete pedagogically in generating empirical

knowledge that is beneficial, educational, and aligned with students' needs is one of the fundamental competencies that teachers, particularly elementary school teachers, must possess.

An effective method for improving teachers' pedagogical skills is to implement creative learning, such as deep learning (Raup et al., 2022). However, implementing this method requires a deeper understanding on the part of teachers of how to design learning that fosters critical, creative, and analytical thinking. There is a need for intensive activities for educators and educational staff to address curriculum-related issues, particularly regarding how to apply deep learning models in the current technological era. Adriana (2021) emphasizes that good pedagogical skills also include a teacher's ability to communicate efficiently with students. However, there are still many elementary school teachers in Malang who face challenges in building supportive interactions. This situation highlights the importance of training in understanding child psychology and classroom management.

Intensive activities that are useful for equipping teachers and staff to carry out the learning process in accordance with the curriculum are workshops, which are often held by various institutions, organizations, and groups from various fields with the same objective. Workshops are highly beneficial for teachers and staff seeking to enhance their teaching skills, as they gain valuable knowledge and experience from presenters, thereby supporting the implementation of activities directly related to the discussed topics. (Husny, 2021). In summary, the conduct of these workshops impacts the improvement of learning quality, where teachers are trained to effectively apply deep learning. Every aspect of this program is an effort to enhance teachers' professionalism and, consequently, the quality of education. (GS et al., 2024).

Deep learning is one of the approaches that has received attention from the government, as it was initiated by the Minister of Primary and Secondary Education, Abdul Mu'ti. This approach emphasizes the importance of creating a comprehensive understanding of deep learning experiences, so that students feel emotionally and mentally involved in the learning process. This curriculum provides students with the opportunity to explore subject matter in greater depth and within a context that aligns with their interests and abilities (Sari, 2023). Therefore, the application of deep learning is highly relevant for providing students with valuable and mindful learning experiences.

The deep learning program serves as a joint guide for teachers, students, parents, and all parties involved to better understand deep learning in education, so that all parties are entitled to information about deep learning. This approach requires teachers to not only master the material, but also be able to create deep and valuable learning experiences for students. (Atmojo et al., 2025). This approach aims to replace the traditional model, which often focuses solely on memorization and repetition of information, with a more reflective and understanding-oriented approach. The deep learning approach places greater emphasis on comprehensive mastery of concepts, which requires extra time and is more adaptive, but is often difficult to implement in educational systems that still prioritize efficiency and academic achievement. (Biggs et al., 2022).

Teachers at SD Negeri Kotalama 3 face a number of serious issues in developing the quality of education. The lack of understanding of new learning approaches, such as deep learning, is one of the most pressing issues, as this approach emphasizes the importance of

involving students in the learning process, and a number of teachers have difficulty applying models that require the integration of technology. As a result, understanding of complex learning can be enhanced both theoretically and in practice. Consequently, the final outcome is that through workshops, educators' ability to select and apply deep learning models can develop and grow effectively.

This study is expected to strengthen the pedagogical abilities of teachers at SDN 3 Kota Lama through workshops on applying deep learning. The specific objective is to convey the ability to design, implement, and evaluate learning strategies that stimulate students to think more critically and creatively and enjoy the excitement of the learning process in the classroom. Through this research activity, it is hoped that constructive changes will occur in classroom teaching practices, improvements in the quality of learning, and ultimately, a meaningful dedication to imparting knowledge and insights to students. With good cooperation and support, this initiative is hoped to become a learning strategy that can be widely applied across various levels of education.

## 2. Method

This study adopts a qualitative approach with the aim of understanding in detail the phenomena developing in the research area in relation to the improvement in teacher performance towards the new approach introduced in the workshop. This study was conducted at SD Negeri Kotalama 3, located at Jalan Muharto Gg. 7 No.41, Kecamatan Kedungkandang, Kota Malang. The data obtained came from sources such as the school principal, Mr. Lutfi Awan Amin, S.Pd., and two homeroom teachers, Mrs. Novita Santi, S.Pd., and Mrs. Lillah Suci Ismarti, S.Pd. The focus of this research was to gather information to prevent bias in the analysis and to understand the context of the institution being studied. The research design used is a case study, where the selected case has not been previously studied by other schools, and the researcher observes the case intensively and then describes it. The researcher employed three data collection methods: interviews with two teachers and one school principal, school observations, and documentary studies. The validity of the information in the study was ensured through triangulation and member checking. The data analysis process included data collection, data presentation, data condensation, and drawing conclusions from the research findings.

The qualitative approach is a subject-centered perspective that involves participants in a case study around the researcher, thereby uncovering interesting phenomena both socially and humanely. This approach focuses on the quality of data collected through interviews, observations, literature reviews, and document analysis. (Karya et al., 2024). Additionally, social sciences that emphasize deep understanding, experience with complex events, and appreciation for research subjects play an important role in qualitative research. (Amane et al., 2023). Observation and meaningful impersonal experiences can provide deep understanding by focusing on various types of social life, such as education, culture, health, and well-being. Triangulation techniques are commonly used when researchers aim to strengthen the validity and reliability of results by utilizing diverse sources, methods, or theoretical perspectives, ensuring that data is accurate and trustworthy. (Zakariah et al., 2020). Qualitative analysis typically involves critically reflecting on perspectives or opinions, where researchers identify themes, patterns, and data categories. (Hasan et al., 2022).

### 3. Results and Discussion

#### 3.1 Implementation of *Workshop* Model as an Effort to Improve Teachers'

##### Pedagogical Competence

Based on the results of interviews with teachers and principals, it is revealed that the implementation of *workshops* at SD Negeri Kotalama 3 is routinely implemented at least once in six months or at least twice in a new school year and its implementation when students have no learning hours or school vacation time. *Workshops* are run in a period of one to two days and even up to one week. The venue for the *workshop* is usually within the school environment of SD Negeri Kotalama 3 such as classrooms or meeting rooms. However, the school also provides facilities for teachers to attend *workshops* outside the school environment, such as yesterday they collaborated with the State University of Malang to procure *workshops* even through invitations from the relevant agencies to join other colleagues in workshops or seminars on improving teachers' pedagogical competence.

The principal also facilitates some of the needs of teachers and staff in organizing *workshops* such as contributions to call resource persons as presenters as well as materials in the form of modules, reflections, and certification for ASN as a form of increasing teacher professionalism as well as guidebooks containing *workshop* materials and directions during *workshop* activities to make them more structured and clear. The *workshop* material discussed will be adjusted to something that is being discussed or *hype* from the government, principals, teachers, students and even the community and parents regarding improving the quality and quantity of teacher performance, so that there are no teachers who are left behind in their skills and abilities. One of the materials that is being discussed and some time ago at SD Negeri Kotalama 3 learned in the *workshop* and will be applied is the *deep learning* approach.

The development of a quality learning process that is optimally carried out by quality teachers, including the Pedagogical Competence of Teachers at SD Negeri Kotalama 3 from the teaching resources of the teacher's human resource prospects is what is used as an *investment* capital in the concept of *empowering* theory to the maximum to be truly effective and effective so that all of its competencies, especially personality and social, contribute more *added* value to realize the goals that have been set together. (Sodikin et.al, 2022). *Workshop* activities that are carried out regularly provide opportunities for teachers to update their insights and abilities in managing the learning process. One of the steps that principals can take to improve teacher performance is to apply various teaching strategies and models that should be used by teachers during the teaching and learning process. The use of appropriate teaching strategies and models will have a good effect on students. (Arman, 2019).

Development with a time allocation pattern outside of teaching hours is a strategic step that allows the Teaching and Learning Process (PBM) to be uninterrupted, so that time is more free even though scheduling can change at any time according to needs. Decision making both in the classroom and outside the classroom / school continuously running or continuity will provide a basic milestone or direction for teachers in managing the pedagogical development of a teacher. (Sodikin et.al, 2022). In the workshop phase, educators were introduced to the fundamental ideas of *deep learning*, which emphasizes the importance of learning processes that encourage students to think critically, creatively, and understand the material thoroughly.

Through oral presentations, discussions and Q&A sessions, educators gained insights into how *deep learning* can lead to more meaningful and relevant learning experiences for students. (Atmojo et.al, 2025).

### **3.2 The impact of the *workshop* on improving teachers' pedagogical competence**

Based on the results of interviews with teachers and principals, it is explained that the provision of *workshops* on the application of *deep learning* by teachers of SD Negeri Kotalama 3 has not been seen to have a significant impact on improving teacher performance, because this approach is a new approach so that teachers have not been able to apply it. However, the *workshop* activities have a very positive impact, because it helps teachers to determine an effective and efficient teaching process. One of the criteria for a teacher is that they must conduct self-development both offline and online. The principal also revealed that all teachers at SD Negeri Kotalama 3 always attend *workshops* held by the school regularly, except for those who are unable to attend due to illness. Teachers who participate in *workshops* and those who do not certainly have differences, but the differences cannot be distinguished significantly. Teachers who attend *workshops* can certainly directly get material and reflections and assignments about the material discussed by the presenters and they also get direct experience from practical experts, while teachers who do not participate can actually access online, but it is less effective and of course there is a difference.

According to Agyeman (2024), workshop programs that incorporate deep learning can support teachers in designing methods to actively engage learners, which in turn will improve their teaching ability. The existence of a workshop program for teachers in designing teaching that focuses on *deep learning* approaches can have a good impact on teachers to implement it with students, in the school environment, and in the community. (Zukmadini et.al, 2021). In educational institutions, efficient management is a must for human resource development. Professional skills development is carried out based on the needs of individual employees or their ability to meet the expectations of related institutions so that these needs can have an overall impact on teachers. Therefore, the development process can run according to the target, if it is also supported by effective management. (Manora et.al, 2024).

Workshops generally focus on in-depth discussion of a particular issue and are complemented by training for participants. Workshop participants will gain new information that is useful and can be implemented in accordance with their profession. (Husny, 2021). The ability of teachers to master new approaches and new learning content will also have a good influence on the achievement of learning outcomes by students. *Workshops* are very helpful in providing the best facilities to support teachers' needs and performance characteristics, because teachers learn how to design, discuss, and then apply the results of the *workshop* in their classroom learning. In the professional competence of teachers, they are also required to understand the teaching materials listed in the latest school curriculum. In understanding the teaching materials, teachers must be able to link the concepts in related subjects. (Muspawi et.al, 2021).

### **3.3 Plan for implementing *deep learning* as a new approach**

Based on the interview results, it was found that so far the *deep learning* program has not been implemented at SD Negeri Kotalama 3, but the teachers have been given training and direction regarding this approach through *workshops*. The principal mentioned that *deep learning* has been planned to be implemented in the 2025-2026 curriculum, the implementation of *deep learning* has also been discussed with the curriculum team of SD Negeri Kotalama 3. Teachers are given direction and reflection to create *deep learning*-based lesson plans with the curriculum team. The curriculum team includes discussion and study of *deep learning*-based learning. The school needs some resources and this study will support this curriculum in the form of documents, so that the principal and teachers of SD Negeri Kotalama 3 are ready to implement *deep learning*, because if there is no preparation the teachers will have difficulties and feel confused about how to use it. According to the study on *deep learning* read, *deep learning* is meaningful learning for teachers and students by giving a touch of technology, meaning in applying in everyday life.

According to Haryanti (2024) *deep learning* is an educational approach that has incorporated 'understanding' into its subject matter, not at all limited to training students to simply memorize or recognize facts, while according to Astuti (2024) the understanding of deep learning is expanded by recognizing six essential abilities called "6C": *Character, Citizenship, Collaboration, Communication, Creativity, and Critical Thinking*. In this sense, *deep learning* will not only pursue academic success in school for children, but also provide them with the skills they need to face real challenges in the world at large. Although *deep learning* is often associated with artificial intelligence technology, in the context of education "*deep learning*" means deep and detailed learning methods. (Wijaya et.al, 2025).

This model integrates the application of basic technology with learning experiences that are full of direct interaction, so schools have an important task to prepare how to make technology a learning medium that has a positive impact in this *deep learning* era. Instructors design learning activities that can be implemented with or without the aid of technology, ensuring flexibility in the teaching process. (Wijaya et.al, 2025). From this perspective, the newly implemented independent learning curriculum is related to the *deep learning* approach that is the current learning plan. Deep learning has a goal that is in line with the independent curriculum, which is to strengthen students' critical thinking and innovation skills needed for them in the future by adopting upcoming technologies.

### **3.4 The role of the *workshop* model as an effort to improve teachers' pedagogical competence.**

Based on the results of interviews with principals and teachers revealed that *workshops* at SD Negeri Kotalama 3 discuss current issues and they claim that with this workshop the teachers can produce works that are useful for teachers in other schools. One of the teachers at SD Negeri Kotalama 3 has produced a work, which is a lesson plan based on *deep learning* so the *workshop* has an important role in providing opportunities for teachers to improve their experience and knowledge. In addition, the *workshop* model also creates a collaboration called the Teacher Working Group (KKG) to exchange opinions, experiences and insights on the issues being discussed, such as the implementation of *deep learning*. In the *workshop* teachers are not only given materials, but they will be given reflections or assignments as a form of developing learning methods that adapt to the needs of students.

According to Kusumaningrum, et al (2024) *workshop* activities are a widely practiced capacity building effort. By participating in *workshops*, educators become more understanding and get advice and techniques for implementing the curriculum that is being or will be used. This activity will prepare teachers to learn everything from designing teaching materials to creating *deep learning* approaches that will be taught to students during the learning process in the classroom. Workshop activities are a means to improve the professionalism of educators, which in turn can improve the quality of education. (Basri et.al, 2021). Teachers are trained to create lesson plans that incorporate relevant strategies, such as problem-solving-based methods, interactive discussions, and collaborative learning. In addition, the training highlighted the importance of integrating fun learning elements in the learning process, for example through educational games, creative activities, and the application of visual or technological tools. (Atmojo et.al, 2025).

### **3.5 Implementation of *Workshop* Model as an Effort to Improve Teachers' Pedagogical Competence**

Based on the interview results, the principal mentioned that one of the most important resources needed in improving teacher performance is the competence of a teacher who is facilitated in the GTK Room and certified. The overall competence of the teachers has actually been carefully prepared, only teachers need to learn and apply it by involving the use of technology, for example AI (*Artificial Intelligence*). In addition, the teachers also revealed that we as teachers must always have developments from within an educator to prepare and create quality and highly competitive educators, and understand technology. Teaching modules or teaching materials made by teachers are also a resource to support the learning process, with the teaching modules the teacher in teaching is more structured and systematic. The written work in the form of teaching modules will be corrected and discussed by experts to provide feedback as a form of evaluation related to teaching in the classroom.

According to Ulfatin and Triwiyanto (2022). A teacher should be able to improve skills and learning programs in preparing more mature students. One of the teacher's abilities and skills can be seen from his professionalism in certified teaching. In addition, principal resources are also needed to improve the quality of education through teacher performance. According to Permendiknas No. 13/2007 regarding the competency standards of school principals, it is necessary for school leaders to have self-awareness to fulfill each basic qualification in the personal field, such as being able to manage education, entrepreneurship, supervision, and relating to the community. Efforts that principals can make are organizing workshop activities as a form of teacher efforts to develop their pedagogical skills and abilities, so that these activities allow teachers to develop their teaching insights. (Alhabsyi et.al, 2022).

The *deep learning* approach also emphasizes the use of technology, so the application of technology has an important role in applying learning methods in this approach. Existing technology allows students to access to various learning platforms that contain diverse and in-depth materials and questions. (Herliana, 2025). Deep learning has been applied in several Asian countries, for example South Korea. The Korean government

collaborated with technology companies to create an AI (*Artificial Intelligence*) based learning system for elementary level students. This system not only serves to assist students in understanding lessons, but also monitors their mental health by analyzing patterns of learning behavior (Kim & Kwon, 2023). Thus, technology strongly supports students to acquire additional resources, so that they are better prepared to face more complicated analysis challenges.

### **3.6 Challenges and Solutions in planning *deep learning* approach as efforts to improve teacher performance**

Based on the interviews, some of the challenges that teachers and principals usually face are as follows: a) the new approach makes teachers feel tired and a little burdened, because they have to learn again and it takes a little longer, b) the lack of careful preparation for teachers, because they are already busy with their teaching hours so that when they are notified of the new approach policy, and c) excessive use of AI (*Artificial Intelligence*) which makes students and teachers less critical thinking. d) lack of understanding of educators and staff in the use of technology. The solutions to the various problems above include: a) teachers who feel tired and a little burdened usually take a break as a form of rest that makes them more relaxed again, b) a teacher's self-awareness is needed to monitor whether the teacher is ready to apply this approach, especially a new approach (*deep learning*), and c) teachers must often monitor their students in using AI and provide positive direction regarding how to make AI (*Artificial Intelligence*) a fun and useful learning media, finally d) there is a need for *workshops* and training from schools to discuss the use of technology in education and support from schools that support the success of teachers in implementing technology-based *deep learning*.

Educational institutions can apply collaborative strategies to educators to ensure that they understand deeply the application of *deep learning*. Educators are given the opportunity to discuss and cooperate with other stakeholders, such as principals, curriculum representatives, and other parties in achieving the goal of getting a deep learning module formulation that is bound between school programs, departments, and existing subjects, so that *deep learning* methods can be integrated effectively. (Khotimah and Abdan, 2025). Research by Lius (2022) showed an increase in student motivation through encouraging involvement and collaboration between fellow students in the learning process, so that they have more opportunities to explore their understanding of good learning skills to achieve maximum learning achievement with the potential they have. According to Pratama and Alfianto (2023), continuous feedback is one of the main parts of the deep learning approach assessment that is given throughout the learning process, so that learners are more helped by self-awareness and reflection that encourages them to continue to correct any mistakes that occur. Therefore, assessment in the deep learning approach is dynamic and adaptive, reflecting the depth and diversity of each student's learning experience.

## **4. Conclusion**

The results of interviews and observations at SD Negeri Kotalama 3 can be summarized as follows: the school conducts workshops as part of the process of developing deep learning for

teachers, with the aim of improving teachers' pedagogical skills, starting with their ability to continue developing and creating new technology-based innovations. The workshops on deep learning, which are attended regularly, are very helpful for teachers in learning how to develop deep learning media and methods. Although SD Negeri Kotalama 3 has not yet implemented deep learning, they have already planned and prepared a curriculum to begin applying deep learning in the 2025-2026 academic year. The application of deep learning requires resources to support the improvement of teachers' pedagogical competencies, such as certified teachers with professional skills and abilities, as well as technological facilities that align with modern developments. Teachers at SD Negeri Kotalama 3 have shown a positive response to the new approach (deep learning) through workshop activities. Therefore, these workshop activities have a beneficial impact on educators' skills in improving their pedagogical teaching abilities. Behind this, school leaders and teachers also face several challenges in implementing deep learning, but they have consciously found appropriate solutions.

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