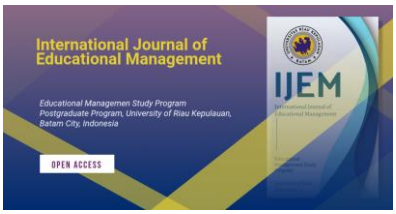

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ANALYSIS OF MANAGEMENT IN IMPROVING TEACHERS' COMPETENCE ON IMPLEMENTING DEEP LEARNING AT SMP NEGERI 6 BATAM

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Abstract

Teachers hold a strategic role in determining the quality of education. The quality of classroom learning is strongly influenced by teachers' competence, professionalism, and readiness in designing relevant and meaningful learning experiences. As agents of change, teachers are not merely transmitters of information, but designers of learning experiences that encourage students to think deeply, critically, and creatively. In modern education, teachers are expected to shift from memorization-based approaches (surface learning) toward deep learning, which emphasizes conceptual understanding, higher-order thinking skills, collaboration, and effective communication. In line with this need, enhancing teachers' competence in implementing deep learning has become increasingly urgent, particularly at SMP Negeri 6 Batam, which is striving to cultivate a more meaningful and adaptive learning culture. This study aims to strengthen teachers' competence in understanding the concepts, strategies, and principles of deep learning so that they can implement them consistently and effectively in the classroom. The findings indicate a significant improvement in teachers' competence, both in theoretical understanding and pedagogical skills. Teachers became more confident, more open to innovation, and more committed to applying deep learning strategies sustainably. These outcomes indicate that the transformation toward more critical, creative, and meaningful learning practices has begun to take shape within the school environment.

Keywords: teacher, competence, deep learning, implementing, management

INTRODUCTION

Education in the 21st century requires a paradigm shift in teaching and learning, in which teachers are no longer solely positioned as transmitters of knowledge, but also as facilitators, mentors, and inspirers who are capable of fostering students' critical thinking, creativity, collaboration, and communication skills (4C) (Biggs et al., 2011; Yasin & Adawiyah, 2022). This paradigm shift leads to the implementation of *deep learning*, an approach that not only emphasizes academic achievement but also prioritizes meaningful conceptual understanding, the connection between knowledge and real-life contexts, and students' ability to solve complex problems reflectively.

As noted by Ikhlas (2020), modern education demands a transition from one-way instruction to participatory, reflective, and transformative learning. In this context, students must be positioned as active agents who are able to understand, relate, and apply knowledge within authentic contexts. This perspective further reinforces the urgency of implementing deep learning in schools as an approach capable of developing 21st-century competencies.

According to Sudrajat (2020), deep learning emphasizes students' active engagement in constructing knowledge, developing critical thinking skills, and solving problems reflectively. Furthermore, Nur and Fatonah (2022) assert that the successful implementation of deep learning requires teachers to possess four core competencies: pedagogical, professional, social, and personal competencies, enabling them to create meaningful and transformative learning environments. Empirical findings by Biggs et al. (2022) indicate that deep learning approaches have been widely adopted across various countries and have proven effective in enhancing students' conceptual understanding and active participation in learning processes. This is further supported by Khairie et al. (2023), who describe deep learning as a pedagogical model that emphasizes comprehensive exploration and critical engagement. Hidayat and Rahmawati (2021) highlight that this approach facilitates interdisciplinary integration and encourages students to connect core concepts with real-world contexts. In addition, Putri and Sari (2023) found that the implementation of deep learning contributes to the development of adaptive, creative, and collaborative student characteristics in facing the challenges of the 21st century.

However, preliminary observations at SMP Negeri 6 Batam reveal that several teachers still encounter challenges in optimally implementing deep learning. These challenges include limited understanding of deep learning concepts, constraints in designing participatory learning strategies, and difficulties in conducting assessments based on deep understanding. This condition indicates the need for systematic and sustainable efforts to enhance teachers' competencies.

In response to these challenges, this study was conducted in the form of a training program entitled *"Enhancing Teacher Competence in Implementing Deep Learning at SMP Negeri 6 Batam."* The study aims to strengthen teachers' understanding, skills, and professional attitudes in designing, implementing, and evaluating deep learning in alignment with the Merdeka Curriculum and contemporary educational demands.

Thus, this research represents a strategic initiative in supporting the program of the Ministry of Education, Culture, Research, and Technology of the Republic of Indonesia to improve teacher competence in order to achieve quality education. Competent teachers contribute directly to improving the quality of the learning process and student learning outcomes (Virgiyanti et al., 2023). Ultimately, the enhancement of teacher competence is expected to serve as a fundamental pillar in supporting Indonesia's demographic bonus toward the vision of *Indonesia Emas 2045*.

Nevertheless, in practice at SMP Negeri 6 Batam, the implementation of deep learning still faces several obstacles. Initial observations indicate that most teachers predominantly rely on conventional lecture-based methods and focus on curriculum completion and examination outcomes, thereby limiting opportunities for students to engage in critical thinking, collaboration, and creative exploration. Additionally, the instructional materials used by some teachers are not yet fully aligned with higher-order thinking skills (HOTS) and tend to emphasize lower-level cognitive tasks. In classroom practice, activities such as group discussions, problem-solving, and collaborative projects—key characteristics of deep learning—are still infrequently implemented, resulting in suboptimal student engagement. Interviews with several teachers also reveal challenges in designing project-based learning strategies and authentic assessments, primarily due to limited conceptual understanding and insufficient practical training.

These findings indicate that although the Merdeka Curriculum and deep learning approaches have been introduced, their implementation at SMP Negeri 6 Batam still requires significant improvement in teacher competence to ensure effective application.

Based on the above considerations, the primary objective of this training program at SMP Negeri 6 Batam is to enhance teachers' competence in understanding, designing, and implementing deep learning in accordance with the demands of the Merdeka Curriculum. Through this study, teachers are expected to develop HOTS-based instructional materials and apply innovative learning models. Therefore, this research not only serves as a means of enhancing teachers' professional capacity but also functions as a strategic effort to promote more meaningful, creative, critical, collaborative, and contextually relevant learning processes that address students' needs and global challenges.

METHODOLOGY

Material

The implementation of training and workshops aimed at improving teacher competence requires a solid foundation through **a** needs assessment. This analysis serves as the basis for determining the relevance of training materials, target participants, and the types of interventions required. The success of the training program is also influenced by the quality of school management, particularly in executing the functions of planning, organizing, actuating, and controlling, as outlined by Helmawati et al. (2025). The POAC model, introduced by G. R. Terry (1958), has been widely applied in educational management due to its effectiveness in enabling institutions to manage human resources, time, and budget in a systematic and efficient manner.

In the context of teacher professional development, the application of the POAC approach provides a systematic framework for designing and implementing measurable training programs. The planning stage focuses on formulating objectives, determining strategies, and designing programs based on the results of the needs assessment, ensuring that the training materials align with both teachers' needs and institutional goals. Effective planning ensures the optimal allocation of available resources.

1. **Planning**
   The planning stage represents the initial phase in management, aimed at formulating objectives, strategies, and concrete steps for the implementation of the training program. Effective planning must be grounded in the results of a needs assessment to ensure that the training materials are relevant to teachers' needs and institutional goals. Well-structured planning directs all resources toward achieving optimal outcomes.
2. **Organizing**
   The organizing stage involves structuring the implementation team, defining roles and responsibilities, scheduling activities, and selecting resource persons. A clear organizational structure is essential to ensure effective coordination throughout the training process.
3. **Actuating**
   The actuating stage refers to directing and mobilizing all stakeholders to implement the planned activities. This stage requires the active involvement of organizers, facilitators, and participants. Creating a conducive, communicative, and participatory learning environment is a key factor in ensuring the effectiveness of the training.
4. **Controlling**
   The controlling stage is conducted to evaluate the effectiveness of the training program, both in terms of process and outcomes. Evaluation is carried out through activity monitoring, assessment of goal attainment, and the collection of participant feedback as a basis for future program improvement. This stage ensures that the training outcomes contribute meaningfully to improving teacher competence.

Through the integrated implementation of these four POAC functions, the training program can be conducted in a more systematic, accountable, and relevant manner, aligned with the needs of teacher professional development within the school context.

Method

This study employed a descriptive qualitative research method aimed at providing a systematic description of how training management is implemented to improve teacher competence in applying deep learning at SMP Negeri 6 Batam. The training program was conducted over a period of three months, from August 31 to October 16, 2025, involving 38 teachers as the primary participants. The research partners included the principal of SMP Negeri 6 Batam, deep learning facilitators from KGTK Riau Islands Province, and the Batam City Education Office.

The research implementation utilized a managerial approach referring to five main functions: planning, organizing, actuating, controlling, and evaluating. These functions were used to systematically describe the sequence of research activities, starting from needs identification, program design, training implementation, mentoring, and evaluation of outcomes. A detailed description of each stage is presented in the subsequent sections to provide a comprehensive understanding of the research process.

Data collection in this study was conducted using three primary techniques**:** observation, in-depth interviews, and documentation study**.** In qualitative research, the researcher serves as the primary instrument for data collection in natural settings (Asep Mulyana, 2024). The use of multiple data collection techniques aims to achieve a comprehensive understanding of the phenomenon under investigation, particularly regarding human resource management in improving teacher competence through training.

Participatory observation was conducted to examine the implementation of the training, focusing on recording interactions, challenges, and deep learning practices. This observation was supported by questionnaires using a Likert scale to measure participants' level of understanding and the effectiveness of the training program. Semi-structured interviews were conducted with training participants to obtain in-depth information regarding the managerial processes involved, from planning and implementation to evaluation. Documentation study involved reviewing relevant documents, including training program plans, activity reports, attendance records, evaluation results, and supporting documentation. Questionnaire data collected through Google Forms were subsequently analysed. Referential adequacy was ensured through the use of documents and field notes to strengthen data interpretation and support research conclusions (Udar & Bashori, 2023).

Data analysis in this study followed the interactive data analysis model proposed by Miles and Huberman (Sakiah & Effendi, 2021), which consists of three main stages: data reduction, data display, and conclusion drawing/verification. This model is considered appropriate for qualitative research as it allows for continuous analysis throughout the research process.

The first stage**,** data reduction, involves simplifying, selecting, and focusing on relevant data related to the research objectives. At this stage, the researcher summarized data obtained from observations, interviews, and documentation concerning human resource management in improving teacher competence through deep learning training at SMP Negeri 6 Batam.

The second stage, data display, involves organizing the reduced data into descriptive narratives, matrices, tables, or diagrams. This process facilitates the identification of patterns, relationships among variables, and the integration of empirical findings with theoretical frameworks.

The final stage, conclusion drawing and verification, is conducted continuously throughout the data collection process. Conclusions are provisional and are repeatedly tested for validity through verification processes such as triangulation and member checking, ensuring that the findings accurately reflect real conditions in the field.

RESULTS AND DISCUSSION

After the completion of this activity, the next objective was to measure the impact of the deep learning training on the improvement of teachers' competence. Table 1 presents an overview of the teachers' initial abilities in understanding the concepts and principles of deep learning, as reflected in their scores before and after the training.

The data show that the average score of teachers before participating in the training was 70.31, while the average score after the training increased to 84.92. Table 1 also illustrates the profile of teachers' abilities in comprehending the concepts and principles of deep learning, where the lowest teacher score before the training was 50, and after the training, it increased to 62. Meanwhile, the highest score before the training was 90, and after the training, it reached 100.

This finding clearly indicates a significant improvement in teachers' understanding of the concepts and principles of deep learning as a result of the professional development program.

Table 1. Pre-Test and Post-Test Scores of Deep Learning Training Participants

No	Participant Name	NIP	Training Scores		
			Pre Test	Post Test	Average
1	Adimas Gustiana A, S.Pd.	19950817 2019031001	86	90	88
2	Afrinaldi S.Pd	199504022022211007	86	88	87
3	Ananada Cica, S.Pd	199308242025212000	86	62	74
4	Anisah Meisura, S.Pd	199705212022212002	82	92	87
5	Ari Setiarsih	199307062023212023	90	100	95
6	Arif Musyakkar	198911102023211008	74	98	86
7	Azra Noveri, S.Kom	19701127 2005021002	74	78	76
8	Cendy Suryabintana, S.Sn	19671023 2014111003	80	82	81
9	Citra Sari Dewi, S.Pd	19860318 2019032002	66	80	73
10	Ermi juriani, S.Pd	199201122023212028	52	76	64
11	Erwani Haloho, S.PdK	196905242023212000	78	98	88
12	Esra Safitri Aritra, S.Pd	199508272025212000	56	78	67
13	Fitra Radianto, S.Pd	19920103 2019031001	50	74	62
14	Jihan Wahyu Pionerita, S.Pd.	19880903 2019032001	90	82	86
15	Junika Simanjuntak, S.S.	198106102024212016	76	96	86
16	Mastiur Nainggolan, S.Pd	198406222024212000	62	96	79
17	Nikson Sitohang, S.S., M.M	19730525 2006041007	68	90	79
18	Nurlaila, S.Pd	198104212024212011	56	74	65
19	Nursantia, S.Pd	199402072023212 000	50	82	66
20	Oktori Joni, S.Kom	198208082022211001	58	88	73
21	Pegi Jasnil, S.Pd	199112162022211002	84	82	83
22	Ria Syam	19900408 2015032003	56	78	67
23	Rizky Amelia S. Pd.	199206112022212012	70	82	76
24	Sri Rejeki, S. Pd.	19660627 198803 012	72	92	82
25	Suroso	19781126 2009031002	68	88	78
26	Yetti Octavia S.Pd	199010032022212001	58	82	70
	Average		70.3	84.92	77.42
	Highest Score		90	100	95
	Lowest Score		50	62	62

Based on the results of the pre-test and post-test administered to the participants of the deep learning training at SMP Negeri 6 Batam, there was a significant improvement in teachers' abilities after the training. The data show that the average pre-test score was 70.31, while the average post-test score increased to 84.92, indicating an average gain of 14.62 points after the program was implemented. This increase demonstrates that the training activities successfully enhanced teachers' understanding and skills in applying the concepts of deep learning.

Before the training, most teachers were still at the basic conceptual level in understanding deep learning strategies. However, after participating in the program, they were able to identify the characteristics of meaningful learning, develop appropriate instructional tools, and implement student-cantered learning approaches in their classrooms.

In addition to quantitative improvement, participant feedback indicated that the training had a positive impact on teachers' motivation and self-confidence in classroom innovation. Teachers reported feeling more prepared to integrate project-based, reflective, and collaborative learning methods, which are the core elements of deep learning.

Therefore, the results of this Deep Learning Training demonstrate that improving teacher competence through structured and practical training can make a tangible contribution to transforming learning paradigms in schools. Teachers no longer act merely as curriculum implementers but as active agents of change, capable of fostering meaningful, critical, and holistic learning experiences that promote students' overall potential.

Table 2. Evaluation Survey of the Deep Learning Training

N	Survey Statement	Excellent	Good	Fair	Poor
1	The organizing committee/reception team behaved politely, courteously, and responsively.	22	3	1	0
2	The organizing committee/reception team responded well to participants and provided adequate assistance.	20	5	1	0
3	The training room was arranged neatly, clean, and comfortable.	16	7	3	0
4	The training speaker had clear and audible voice intonation.	19	4	3	0
5	The training materials were presented in a structured and easily understandable manner.	19	4	3	0
6	The training facilities were sufficient to achieve the training objectives.	15	8	3	0
7	The training speaker explained the materials clearly.	20	6	0	0
8	The training speaker was able to respond well to participants' questions.	21	5	0	0
9	The training speaker provided relevant answers corresponding to participants' questions.	17	9	0	0

10	The training speaker presented the material using attractive PowerPoint visuals.	23	2	1	0
11	Training participants were able to understand the material presented by the speaker.	18	7	1	0
12	The training materials were beneficial for me as a teacher.	20	5	1	0
13	Training participants have great opportunities to apply it effectively in their respective schools.	19	6	1	0
14	Overall, the training was conducted effectively.	18	8	0	0

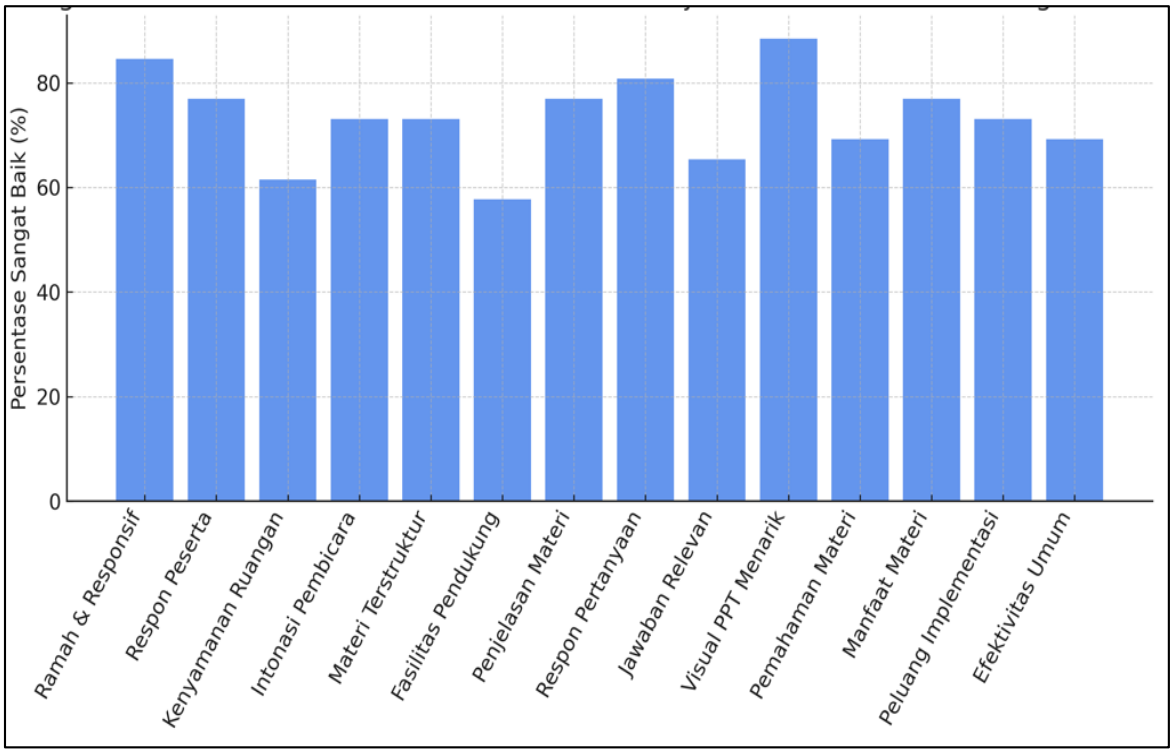

Figure. Diagram of the Deep Learning Training Effectiveness Survey Results

Based on the results of the evaluation survey of the Deep Learning Training at SMP Negeri 6 Batam, conducted through Google Forms, the data indicated a significant improvement in teachers' understanding and application of deep learning concepts. The survey was participated in by 26 teachers from various subject areas, with a 100% attendance rate throughout the program. The results showed that the majority of respondents rated the training as "Excellent" across almost all measured aspects. In terms of service and committee attitudes such as friendliness, courtesy, and responsiveness 88% of participants rated them as excellent. The aspects of room comfort and adequacy of training facilities also received positive evaluations, with an average of 80% of respondents rating them as excellent.

Regarding the delivery of materials, the survey results indicated that the speakers demonstrated excellent performance, with 84% of participants assessing the explanations as clear, structured, and easy to understand. Furthermore, 90% of participants stated that the training materials were highly beneficial and relevant to the enhancement of teacher competence in implementing deep learning. Additionally, the aspect concerning the impact of the training on teachers' readiness also showed positive results. Based

on these findings, it can be concluded that the Teacher Competency Improvement Training in Implementing Deep Learning at SMP Negeri 6 Batam was highly effective not only in terms of its technical execution but also in its direct benefits for improving teachers' competence and readiness to implement meaningful learning in the classroom.

Thus, the implementation of this deep learning training not only succeeded in significantly improving teacher competence but also produced sustainable impacts, including innovative products and inspirational models of teacher empowerment that can continue to be developed as best practices in supporting the implementation of the *Merdeka Curriculum* at SMP Negeri 6 Batam.

CONCLUSION

Based on the discussion above, it can be concluded that the Teacher Competency Improvement Training in Implementing Deep Learning at SMP Negeri 6 Batam was conducted successfully and had a positive impact on improving teachers' professional competence. The results of the pre-test and post-test showed an average increase of 14.62 points, indicating a significant improvement in teachers' understanding of the concepts and implementation of deep learning. In addition, the evaluation survey revealed a very high level of participant satisfaction, with 73% of participants rating the program as "Excellent," 24% as "Good," and 3% as "Fair," with no negative responses. This training proved effective in improving teachers' ability to apply deep learning practices. Teachers also demonstrated positive behavioural changes, such as increased motivation, openness to innovation, and readiness to apply deep learning strategies in the classroom. Thus, this Teacher Competency Improvement Training not only succeeded in improving teachers' pedagogical and professional competencies but also strengthened their role as agents of change in fostering a meaningful, adaptive, and sustainable learning culture. This program is expected to serve as a model for teacher capacity development in other schools to improve the overall quality of teaching and education.

Based on the implementation results of the deep learning training and the evaluation survey showing a high level of participant satisfaction, several suggestions can be made for future programs. First, similar training activities should be conducted continuously with more specific topics, such as the development of deep learning-based instructional tools, authentic assessment, and the integration of digital technology in meaningful learning. Second, there is a need for follow-up mentoring sessions to ensure that teachers can implement deep learning concepts in their classrooms consistently and measurably. Related to the outcomes of this teacher competency improvement training, it is recommended that teachers continue to improve their competencies through ongoing training, reflective practice, and collaboration with peers. Schools are encouraged to provide support in the form of learning facilities and professional development forums, while the Department of Education should expand similar programs to other schools with consistent monitoring. Furthermore, universities as teacher competency improvement training partners are encouraged to continue providing assistance and developing training modules that align with teachers' needs. Through synergy among all stakeholders, the implementation of deep learning can be sustained and have a positive impact on the overall quality of education.

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It is hoped that this collaboration will continue to flourish in the future to further enhance the quality of education and support the implementation of deep learning practices in schools.

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