



IMPROVING ELEMENTARY SCHOOL TEACHERS TEACHING COMPETENCIES THROUGH DEEP LEARNING TRAINING IN BATAM CITY

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ABSTRACT

school teachers play a crucial role in implementing the Independent Curriculum, particularly in developing students' critical, creative, and collaborative thinking skills. However, initial observations indicate that many elementary school teachers in Batam City still face difficulties in designing and implementing in-depth learning. This management analysis aims to improve the competency of elementary school teachers through workshop-based training, teaching simulations, and mentoring. The research was conducted at several elementary schools in Batam City with 32 teachers participating. Evaluation included pre-and post-tests, observations of teaching practices, and participant response questionnaires. The results showed a significant increase in conceptual understanding, skills in designing lesson plans based on in-depth learning, and positive attitudes towards the implementation of innovative learning. Thus, this training is effective in improving the competence of elementary school teachers, and needs to be continued with ongoing mentoring. This study was limited to elementary school teachers in Batam City. Future studies should conduct comparative research across urban, hinterland, and border-area schools in the Riau Islands Province to examine how geographical context, infrastructure disparities, and socio-cultural factors moderate the effectiveness of deep learning training on teaching competencies. Cross-regional studies would strengthen the generalizability of the model.

Keywords: Management Analysis, Elementary School Teachers, Teaching Competence, Deep Learning.

INTRODUCTION

Basic education plays a fundamental role as the foundation for developing students' cognitive intelligence, character, and social skills; the quality of the learning process at this level significantly determines students' readiness to face the demands of the 21st century. The central government, through its Independent Curriculum policy and Deep Learning guidelines, is encouraging the transformation of learning practices to make them more meaningful, student-centered, and capable of developing higher-order thinking competencies (Ma'ariif SN, 2025).

However, at the practical level, numerous reports and studies indicate that the implementation of truly in-depth learning is uneven; surface learning practices *oriented* toward memorization are still common, thus under-developing critical thinking skills, creativity, and the ability to apply knowledge in real-world contexts (Kerimbayev, Umirzakova, Shadiev, & Jotsov, 2023). This situation indicates a gap between policies/guidelines and teachers' capacity or practice patterns in the classroom, thus reinforcing the need for interventions based on strengthening teacher capacity through contextual training and mentoring. International literature on teacher professional development confirms that

effective training programs have the following characteristics: practice-based (*hands-on*), collaborative, supplemented by ongoing mentoring, and supported by policies and institutional infrastructure; these models have shown positive impacts on changing attitudes, improving pedagogical competence, and adopting new learning strategies (*systematic reviews on teacher professional development*). Therefore, interventions that consist only of short workshops tend to be less likely to provide lasting changes in practice without follow-up and institutional support (Amemasor, Oponng, Ghansah, Benuwa, & Essel, 2025).

Specifically in the Indonesian context, the transformation to the Merdeka Curriculum places Deep Learning (PM) as the main approach which requires a change in the teacher's role from a presenter of material to a learning facilitator who designs meaningful learning experiences (Merdeka Curriculum Guide; platform Merdeka Mengajar (Teaching Freedom) as a means of support. Despite the availability of modules and platforms, real challenges reported include teacher preparedness, limited practical experience in designing deep learning-based lesson plans, and the need for contextual support tailored to school and student characteristics (Ministry of Education, Culture, Research, and Technology; Merdeka Mengajar Platform). Therefore, strengthening elementary school teacher competencies through research activities that combine workshops, simulations, and practical support is a logical and strategic step.

From a pedagogical perspective, deep learning emphasizes conceptual understanding, organizing knowledge, and transferring skills to new situations, thus requiring teachers to be skilled in designing authentic tasks, managing high-level discussions, and holistically assessing learning processes and products. Implementing this approach in classroom practice will require teachers to improve their pedagogical and professional competencies, including the ability to design lesson plans (RPP/TP) that prioritize conceptual connectivity, *scaffolding*, and formative assessment, which in turn can improve meaningful learning outcomes for students. Literature on student-centered approaches and the use of technology also supports that student-centered learning strategies can strengthen engagement and learning outcomes if teachers receive structured training and technical support.

Based on the description above, the main problem that arises is: how to design and implement a Research intervention in the form of effective in-depth learning training to improve the teaching competency of elementary school teachers in Batam City, so that there is a sustainable change in learning practices? Available alternative solutions include: (1) short-term large-scale training without mentoring, (2) intensive training programs accompanied by ongoing mentoring, and (3) building a school-based learning community (*Professional Learning Community*) combined with access to digital resources. Evidence review shows that a combination of practical training (workshop + simulation) and medium-term mentoring/mentoring provides the most promising results in changing teacher practices (characteristics of effective TPD) (Firdaus, Nurmatias, Liana, Abidin, & Denico, 2025). Therefore, the program chosen in this Research is a structured training package followed by in-class mentoring (*coaching*) and the formation of a teacher community to support the sustainability of changes in practice.

The purpose of this research is formulated narratively as an effort to strengthen the pedagogical competence of elementary school teachers in Batam city through in-depth learning training that combines theory, practice (*micro-teaching simulation*), and implementation assistance in the classroom. The usefulness of this research is practical and strategic: practically, it is expected that teachers are able to design deep learning-based lesson plans, apply learning strategies that encourage higher-order thinking, and conduct authentic assessments; strategically, the results can be a model for research activities replicated by local education offices or higher education institutions for continuous quality improvement programs. Policy support and empirical evidence on the characteristics of effective TPD are a strong basis for the urgency of implementing this research in the Batam context.

Theoretical Review

Definition of Teaching Competency Teaching competency refers to an integrated set of knowledge, skills, attitudes, and values that enable teachers to perform their professional duties effectively to facilitate student learning (Shulman, 1987; Selvi, 2010). It is not merely the mastery of subject matter, but the ability to transform content knowledge into pedagogically powerful forms that are adapted to the diverse needs of learners. Competency is therefore performance-based and observable in classroom practice, distinguishing it from abstract qualifications or certificates. According to the OECD, teaching competencies are “the complex combination of knowledge, skills, understanding, values, and attitudes that lead to effective action in situ.” This definition emphasizes that competency is contextual and manifested in real teaching situations rather than in Isolation (2009).

Dimensions of Teachers’ Teaching Competencies

Several models have been developed to classify teaching competencies. Three of the most widely cited frameworks are:

1) Shulman’s Model of Teacher Knowledge Base

Shulman proposed seven categories that form the foundation of teaching competency: (1) Content Knowledge: Deep understanding of the subject matter. (2) General Pedagogical Knowledge: Broad principles and strategies of classroom management and organization. (3) Curriculum Knowledge: Familiarity with materials and programs that serve as tools of the trade. (4) Pedagogical Content Knowledge (PCK): The blending of content and pedagogy into an understanding of how particular topics are organized, represented, and adapted to learners’ interests and abilities. PCK is considered the hallmark of expert teaching. (5) Knowledge of Learners: Understanding students’ characteristics, preconceptions, and learning difficulties. (6) Knowledge of Educational Contexts: Awareness of school, community, and cultural factors. (7) Knowledge of Educational Ends: Understanding the purposes, values, and philosophical grounds of education (1986; 1987).

2) Indonesian Law No. 14/2005 on Teachers and Lecturers

In the Indonesian context, teaching competency is legally mandated to include four core competencies: (1) Pedagogical Competency: Ability to manage student learning, including understanding learners, designing and implementing instruction, evaluating outcomes, and developing student potential. (2) Personality Competency: Steady, mature, wise, and authoritative personal qualities that serve as role models for students. (3) Social Competency: Ability to communicate and interact effectively with students, fellow teachers, parents, and the community. (4) Professional Competency: Broad and deep mastery of learning material, including mastery of curriculum, scientific substance, and scholarly structure of the subject.

3) Danielson’s Framework for Teaching

This framework divides teaching competency into four domains of professional practice: Planning and Preparation: (1) Demonstrating knowledge of content and pedagogy, setting instructional outcomes, and designing coherent instruction. (2) Classroom Environment: Creating a culture for learning and managing classroom procedures. (3) Instruction: Communicating with students, using questioning and discussion techniques, and engaging students in learning. (4) Professional Responsibilities: Reflecting on teaching, maintaining records, and participating in professional communities.

Indicators of Effective Teaching Competencies

Based on synthesis of the above models, effective teaching competencies can be observed through several key indicators: (1) Instructional Design Competency: The ability to formulate clear learning objectives, select appropriate materials, and design varied learning activities aligned with students’ developmental levels. (2) Instructional Implementation Competency: Skill in delivering

material, managing time, using instructional media, applying learning models, and conducting apperception, core activities, and closure systematically. (3) Classroom Management Competency: Creating a positive, safe, and democratic learning climate; managing student behavior; and organizing physical space to support interaction. (4) Assessment Competency: Designing, administering, and analyzing authentic assessments; providing constructive feedback; and using results for instructional improvement. (5) Technology Integration Competency: Ability to utilize ICT and digital platforms to enhance engagement and accommodate 21st-century learning [UNESCO (Mulyasa, 2013; Brown, 2018).

Relationship Between Teaching Competency and Learning Outcomes

Numerous empirical studies confirm a positive correlation between teachers' teaching competencies and student achievement. Darling-Hammond (2000) found that teacher quality, measured by certification, subject-matter knowledge, and pedagogical training, is the strongest school-related predictor of student learning. In the Indonesian context, studies by Jalal et al. (2009) showed that teachers with higher professional and pedagogical competency scores produced students with significantly better national exam results. More recent evidence during the COVID-19 disruption further reinforces this link. König, Jäger-Biela, and Glutsch (2020) investigated early-career teachers in Germany during school closures and found that teachers with stronger pedagogical competence and ICT-related competence were significantly better at mastering the challenges of emergency remote teaching, maintaining instructional quality, and sustaining student engagement. Their study revealed that teacher competence not only predicts face-to-face learning outcomes but also determines adaptability and effectiveness in technology-mediated learning environments. This finding extends Darling-Hammond's conclusion by showing that in the 21st-century context, teaching competency must include digital pedagogical skills to ensure learning continuity and quality. Thus, improving teaching competency covering pedagogical, professional, personal, social, and digital dimensions is a strategic entry point for enhancing educational quality in both normal and crisis situations.

MATERIAL AND METHODS

This community research activity uses a *Participatory Action Research* (PAR) approach that emphasizes the active involvement of teachers as partners in every stage, from planning, implementation, observation, to reflection (Sugiyono, 2022). This approach was chosen because it aligns with the research objectives, which require direct collaboration with teachers as subjects of competency development (Muthi, Haryono, Rubai, Alam, & Sugiarti, 2025). The activity was conducted from July 19–23, 2025, at several elementary schools in Batam City, involving 32 elementary school teachers as participants. These teachers were selected using a purposive sampling technique based on the following criteria: teaching at least one regular class, being willing to participate in all activities, and having received a recommendation from the school principal (Nurhayati, Latif, & Anwar, 2024).

The implementation of the activity was divided into several stages. On the first day, an initial needs survey was conducted to identify teacher barriers in implementing in-depth learning, followed by a pre-test. The second day focused on a workshop on the concept of immersive learning and its application in the Independent Curriculum. The third day included simulations or microteaching, where teachers designed lesson plans based on immersive learning and practice with the guidance of a facilitator. On the fourth day, teachers received direct guidance in class through observations using an observation rubric (Mahanis, Nurfaizah, Varadilla, & Liana, 2025). Furthermore, on the fifth day, a post-test, in-depth interviews, and focus group discussions (FGDs) were conducted to explore teachers' experiences and reflections before the activity closed (Juliana, Helmawati, Nasyanawati, Awaliyah, & Fadlullah, 2025).

Table 1. Activity Schedule

Day / Date	Main Activities	Activity Form
Day 1 (July 19, 2025)	Orientation & Pre-test	Opening, program introduction, teacher needs survey, initial questionnaire completion, pre-test for understanding of in-depth learning concepts
Day 2 (July 20, 2025)	Deep Learning Concept Workshop	Delivery of material on in-depth learning, principles of the Independent Curriculum, active learning strategies, group discussions
Day 3 (July 21, 2025)	Simulation and Microteaching	Teachers prepare lesson plans based on in-depth learning, teaching practice (microteaching), observation and feedback from facilitators.
Day 4 (July 22, 2025)	Mentoring in Class	Teachers carry out in-depth learning in real classes/mini classes, facilitators carry out observations using assessment rubrics.
Day 5 (July 23, 2025)	Evaluation, Post-test, and Reflection	Post-test, in-depth interviews and FGD, joint reflection, closing of activities, delivery of recommendations for further development

The research instruments used included written tests (pre-test and post-test) to measure teachers' conceptual understanding, an observation rubric to assess teaching skills, a Likert-scale participant response questionnaire to determine satisfaction and perceived benefits, and interviews and focus group discussions (FGDs) to obtain qualitative data regarding teachers' experiences (Arikunto, 2022). Quantitative data were analyzed descriptively and inferentially using paired t-tests to determine the significance of competency improvement. Meanwhile, qualitative data were analyzed using thematic analysis techniques, followed by triangulation to ensure more valid and comprehensive results (Kusumaningrum et al., 2024).

Instrument validity was obtained through expert judgment, and questionnaire reliability was tested using Cronbach's alpha (Creswell, 2020). Furthermore, data validity was strengthened through method triangulation by combining test results, observations, interviews, and documentation (Dori & Firmansyah, 2022). Research ethics were also maintained by providing *informed consent* to participating teachers, maintaining confidentiality, and ensuring that data were used solely for program development purposes (Afkar Ramadhani, Abidin, & Faiz Ridlo, 2024).

RESULT AND DISCUSSION

The immersive learning training was attended by 32 elementary school teachers in Batam City for five days (July 19–23, 2025). All participants were fully present and actively participated in each series of activities. Pre-test results showed that teachers' initial understanding of the concept of immersive learning was still relatively low, with an average score of 58.13. After participating in the training, post-test scores increased significantly, with an average of 82.94. This represents an increase of 24.81 points, or approximately 42.7%, from the initial score.

In addition to written tests, observations of teaching practices also showed positive changes. Before the training, the majority of teachers still used simple lecture and assignment methods. After training and mentoring, teachers are able to prepare lesson plans based on in-depth learning, involve students in group discussions, and use high- *order thinking skills* (HOTS).

Teacher responses via questionnaire also showed positive results. 87.5% of teachers stated that the training materials were very useful, 81.2% stated they were ready to implement in-depth learning in their classrooms, and 90.6% felt the need for further mentoring.

Table 2. Teacher Pre-test and Post-test Results (N = 32)

Statistics	Pre-test	Post-test
Average	58.13	82.94
The highest score	70	95
Lowest Value	45	70
Standard Deviation	6.21	7.12

A paired t-test showed that the difference between pre-test and post-test scores was statistically significant at the $\alpha = 0.05$ level ($p < 0.001$). This confirms that the training significantly improved teacher competency.

Discussion

The results of the increase in teachers' average scores from pre-test to post-test indicate that workshop-based training, simulations, and mentoring are effective in improving teachers' conceptual understanding. This finding aligns with Karsiyem's research, which demonstrated that workshops significantly improve teachers' competency in lesson planning (Karsiyem, 2023). The changes in teachers' skills in designing and implementing in-depth learning also support the findings of Maharyati and Ningsih's research, which emphasized the importance of ongoing training to develop teachers' pedagogical, social, and professional competencies (Maharyati & Ningsih, 2025). Furthermore, teachers' positive responses to the program indicate their high motivation to adopt innovative strategies, as also found in Nafi'ah's research, which highlighted the role of workshops as a means of enhancing professionalism (Nafi'ah, 2022).

This training also aligns with the spirit of the Independent Curriculum, which demands student-centered learning and encourages creativity, collaboration, and critical thinking. Improving teachers' competency in designing immersive learning-based lesson plans will directly impact the quality of classroom learning, particularly in fostering 21st-century skills in students (Rosni, 2021). However, the questionnaire results also showed that most teachers still need ongoing mentoring. This suggests that short-term training needs to be followed by follow-up activities so that teachers can consistently implement in-depth learning. This finding aligns with Mujianto et al., who emphasized that intensive post-training mentoring is crucial to ensuring the continued implementation of innovative learning strategies (Mujianto, Wibowo, Tinus, & Setiawan, 2025). To determine teachers' perceptions of in-depth learning training, a questionnaire was administered with a Likert scale (1–5) covering four main aspects: (1) satisfaction with training, (2) perception of benefits, (3) readiness to implement, and (4) need for further assistance.

Table 3. Teacher Response Questionnaire Results (N = 32)

Measured Aspects	Percentage of Agree & Strongly Agree	Percentage of Undecided	Percentage of Disagree
The training material is easy to understand	90.6%	6.2%	3.2%
Useful training for teachers	87.5%	9.4%	3.1%
Teachers are ready to implement in class	81.2%	15.6%	3.2%
Need for ongoing support	90.6%	6.3%	3.1%

The questionnaire results showed that the majority of teachers found the training very useful (87.5 %) and the material easy to understand (90.6%). Most teachers (81.2 %) stated they were ready

to implement in-depth learning strategies in their classrooms. However, 90.6 % of teachers also stated they still needed ongoing support to ensure consistent implementation of these methods. This indicates that although the training successfully improved teachers' understanding and preparedness, implementation in real classrooms still requires further support from facilitators and the teacher learning community. This finding aligns with Novalia's research, which emphasized that post-training mentoring is crucial for maintaining consistent implementation of innovative learning strategies (Novalia, 2024) .

CONCLUSION

Research activities in the form of in-depth learning training conducted on July 19–23, 2025 in Batam city involving 32 elementary school teachers were proven to be effective in improving teacher teaching competencies. This was indicated by a significant increase in the average pre-test score (58.13) to post-test (82.94) as well as the results of teaching practice observations that demonstrated teachers' abilities in designing lesson plans based on in-depth learning, facilitating student activities, and using high-level questions. Teacher responses through questionnaires also showed a positive attitude towards the training program, where most participants felt helped, motivated, and committed to implementing in-depth learning in their classes. Thus, this training can be concluded as a program that has successfully provided a real impact in improving the pedagogical competence of elementary school teachers, while also supporting the implementation of the Independent Curriculum which emphasizes student-centered learning. Based on the results of this research, several recommendations can be proposed to support the sustainability and improvement of similar programs in the future. First, it is recommended that training programs on in-depth learning be conducted continuously and systematically, not only in the form of short-term workshops but also followed by structured mentoring and coaching in real classroom settings. This is important to ensure that teachers are able to consistently apply the concepts and strategies that have been learned.

Second, schools are encouraged to establish Professional Learning Communities (PLC) as a forum for teachers to share experiences, reflect on teaching practices, and collaboratively solve problems related to the implementation of in-depth learning. The existence of such communities can strengthen peer support and foster a culture of continuous professional development. Third, local education authorities are expected to provide policy support, facilities, and access to relevant learning resources, including digital platforms such as Merdeka Mengajar, to enhance teachers' competencies in implementing student-centered learning approaches. However, several challenges need to be considered, such as limited time for teachers to participate in intensive mentoring, differences in teachers' initial competencies, and varying school conditions that may influence the effectiveness of program implementation. Therefore, future programs should be designed more flexibly and adaptively according to the needs and contexts of each school.

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