

Reflection On the Interpretation and Implementation of Deep Learning by Physical Education Teachers at SMA Negeri Urban Java

Stevy Nurul Octavia¹, Muhammad Hamid Anwar²

^{1,2}Universitas Negeri Yogyakarta, Yogyakarta, DIY, 55281, Indonesia

ABSTRACT: This research aims to reflect on the interpretation and implementation of deep learning by Physical Education teachers in high schools in the Urban Java region. This research employed qualitative methods, involved 9 Physical Education (PE) teachers selected based on their teaching experience and involvement in the learning process. The research instrument was a Human Instrument equipped with an interview protocol and a recording device. The data were collected through in depth interviews and analyzed by using the Miles and Huberman interactive model, which included data reduction, data presentation, and conclusion drawing. The data validity was assessed through credibility, transferability, dependability, and confirmability tests. The research findings reveal that teachers' interpretations of deep learning vary and are affected by their teaching experience, educational background, and involvement in outreach and training. In general, teachers define deep learning as student-centered, providing meaningful learning experiences, connecting theory with practice, and encouraging students to understand the benefits of physical activity in everyday life. The implementation of deep learning is realized through strengthening comprehension prior to practice, providing authentic movement experiences, utilizing technology, implementing learning differentiation, authentic assessment, and reflecting on activities. The strategies used by teachers include providing apperception and conceptual reinforcement, experiential movement based learning, discussions and group work, peer tutoring, the use of digital technology, and ongoing reflection on the learning process and outcomes. Teacher reflections indicate that indepth learning in Physical Education (PE) is not understood as an entirely new approach, but rather as a reinforcement of existing learning practices through deepening understanding, providing meaningful learning experiences, and fostering active student lifestyle habits. Although its implementation is still in the adaptation phase and teachers' comprehension is not yet fully noticed, PE teachers generally believe that in-depth learning has the potential to improve the quality of learning as it integrates aspects of students' knowledge, skills, and character more holistically.

KEYWORDS: in-depth learning, interpretation, learning implementation, PE, teacher reflection.

I. INTRODUCTION

The rapid transformation of education in the twenty-first century has shifted instructional priorities from knowledge transmission toward the development of higher-order thinking, problem-solving, creativity, collaboration, and lifelong learning competencies. This transformation requires learning environments that enable students not only to acquire knowledge but also to construct conceptual understanding, transfer knowledge across contexts, and regulate their own learning through reflective processes (Hamzah et al., 2023). Consequently, many educational systems have adopted pedagogical approaches that emphasize meaningful learning experiences capable of developing cognitive, affective, and metacognitive competencies simultaneously. Within this context, the Indonesian Merdeka Curriculum introduces Deep Learning as a pedagogical approach intended to promote meaningful, student-centered learning that integrates conceptual understanding, authentic experience, reflection, and knowledge transfer.

Deep Learning has been widely recognized as an educational approach rather than a new curriculum or instructional model. Fullan and Langworthy (2014) described Deep Learning as a transformative pedagogy that prepares learners for increasingly complex social and professional environments through authentic learning, collaboration, creativity, critical thinking, and character development. Similarly, Hattie and Donoghue (2016) emphasized that meaningful learning occurs when learners develop conceptual understanding that enables them to transfer knowledge into unfamiliar situations. More recently, educational research has reinforced that Deep Learning involves active knowledge construction, metacognitive regulation, and reflective thinking rather

Reflection On the Interpretation and Implementation of Deep Learning by Physical Education Teachers at SMA Negeri Urban Java

than simple participation in classroom activities (Thornhill-Miller et al., 2023). Therefore, successful implementation depends not only on instructional techniques but also on teachers' pedagogical understanding of the underlying educational philosophy.

Despite increasing policy support, translating Deep Learning into classroom practice remains challenging. Previous studies have reported considerable variation in teachers' interpretations of Deep Learning, often resulting in inconsistent instructional implementation (Casey & Kirk, 2020). Rather than emphasizing conceptual understanding and reflective inquiry, teachers frequently interpret Deep Learning as merely providing more active, enjoyable, or technology-supported classroom activities (Mahardika & Jaya, 2025). Such interpretations reduce Deep Learning to instructional strategies while overlooking its broader pedagogical purpose of fostering meaningful understanding and lifelong learning. These inconsistencies suggest that teachers' professional beliefs and pedagogical reasoning substantially influence curriculum implementation beyond the curriculum documents themselves.

The implementation of Deep Learning becomes even more complex within Physical Education (PE), where learning simultaneously encompasses psychomotor, cognitive, affective, and social development. Contemporary Physical Education is expected not only to improve students' movement competence but also to cultivate conceptual understanding, critical decisionmaking, healthy lifestyles, and reflective thinking (Slingerland & Borghouts, 2021). Models-Based Practice and Teaching Games for Understanding have demonstrated that meaningful movement experiences encourage students to understand why movements are performed rather than merely how they are executed (Casey & MacPhail, 2018). Nevertheless, instructional practices in many schools continue to prioritize technical skill acquisition and physical participation, limiting opportunities for conceptual learning and reflective engagement. Consequently, Physical Education often remains dominated by procedural learning rather than meaningful educational experiences.

Evidence from preliminary observations conducted in Urban Public Senior High Schools in Java revealed similar concerns. Although students actively participated in movement activities, many demonstrated limited conceptual understanding of learning objectives, experienced difficulty explaining the educational value of physical activities, and rarely engaged in reflective discussions concerning their learning experiences. These observations indicate that physical participation alone does not necessarily represent meaningful learning. Hattie & Donoghue (2016) argued that meaningful engagement requires conceptual understanding, while Loughran (2002) emphasized that reflection enables learners to transform practical experiences into meaningful knowledge. Likewise, Panadero (2017) identified reflective learning as a fundamental component of metacognitive regulation and self-directed learning. Without these elements, students are likely to experience surface learning despite appearing physically active during instruction.

Understanding these instructional differences requires attention to teachers' interpretation of educational policy. Teachers naturally interpret new pedagogical concepts through previously established beliefs, professional experiences, and habitual instructional practices (Pajares, 1992). Mezirow (2000) explained that individuals construct meaning by integrating new experiences into existing frames of reference, whereas Korthagen (2017) argued that reflective practice enables teachers to critically examine and reconstruct their pedagogical reasoning. Consequently, differences in classroom implementation cannot be explained solely by curriculum policy or school resources; they also emerge from teachers' reflective capacity to reinterpret educational innovations within authentic teaching contexts. Reflection therefore functions not merely as an evaluative activity but as an epistemological process through which teachers continuously reconstruct professional knowledge and instructional decision-making.

Previous research concerning Deep Learning has predominantly examined curriculum implementation, instructional models, students' learning outcomes, and teachers' perceptions of educational reform. Although these studies have substantially contributed to understanding instructional innovation, relatively limited attention has been devoted to examining how teachers construct, negotiate, and reconstruct the meaning of Deep Learning through reflective professional practice, particularly within Physical Education. Existing studies generally assume that teachers possess similar conceptual understandings of Deep Learning, while overlooking the influence of pedagogical beliefs, reflective experiences, and contextual conditions on curriculum implementation. Furthermore, research specifically investigating reflective practice among Indonesian Physical Education teachers remains scarce, especially within urban public schools where curriculum reform, administrative demands, and professional expectations intersect. This gap limits current understanding of why identical educational policies frequently produce diverse classroom practices.

The novelty of this study lies in positioning teacher reflection as the principal analytical lens for understanding the interpretation and implementation of Deep Learning within Physical Education. Rather than evaluating instructional effectiveness or students' achievement, this study investigates how teachers' reflective experiences shape their pedagogical interpretations and

Reflection On the Interpretation and Implementation of Deep Learning by Physical Education Teachers at SMA Negeri Urban Java

influence instructional practices. By integrating theories of teacher reflection, pedagogical reasoning, and curriculum interpretation, this research extends existing literature beyond implementation studies toward understanding the cognitive processes underlying educational change. The findings are expected to contribute both theoretically to research on teacher cognition and reflective pedagogy and practically to the development of professional learning programs supporting meaningful implementation of Deep Learning in Physical Education.

This study aims to explore how Physical Education teachers in Urban Public Senior High Schools in Java interpret the concept of Deep Learning, implement it within classroom practice, and reflect upon their professional experiences throughout the implementation process. Understanding these reflective processes is essential for bridging the gap between educational policy and classroom practice while strengthening meaningful learning within Indonesia's Merdeka Curriculum.

II. METHODS

A. Research Design

This study employed a qualitative descriptive research design to explore how Physical Education (PE) teachers interpret and implement Deep Learning through reflective professional practice. A qualitative approach was selected because the study sought to understand teachers' experiences, meanings, beliefs, and pedagogical reasoning within their natural educational contexts rather than to measure predetermined variables quantitatively. Reflection was positioned as the primary analytical lens for examining how teachers construct meaning from educational policy and translate that understanding into classroom practice.

B. Research Setting and Participants

The research was conducted in public senior high schools located in Urban Java, Indonesia. These schools were selected because they represent educational institutions with relatively high access to curriculum innovation, professional development programs, and government educational policies concerning the implementation of the Merdeka Curriculum.

Nine Physical Education teachers participated in the study. Participants were selected using purposive sampling to ensure that every participant possessed relevant professional experience and had been directly involved in implementing Deep Learning within Physical Education learning. The inclusion criteria consisted of:

1. actively teaching Physical Education in public senior high schools
2. having experience implementing the Merdeka Curriculum
3. participating in curriculum socialization or professional development activities
4. Having at least 5 years of teaching experience and being certified
5. willing to participate voluntarily throughout the research process.

The diversity of participants' teaching experiences and educational backgrounds enabled the researcher to obtain rich information regarding different interpretations and implementation practices of Deep Learning.

C. Data Collection

The researcher served as the primary research instrument (human instrument) supported by a semi-structured interview protocol and digital audio recording devices. Semi-structured interviews were selected to provide sufficient flexibility for participants to explain their experiences while ensuring consistency across interview sessions. Data collection was conducted through in-depth face-to-face interviews. Each interview explored teachers' understanding of Deep Learning, classroom implementation, instructional strategies, reflective experiences, supporting factors, and implementation challenges. Interviews were audio-recorded with participants' informed consent and subsequently transcribed verbatim for analysis.

To strengthen contextual understanding, interview findings were complemented with field notes documenting participants' responses, classroom contexts, and non-verbal observations during data collection. All participant identities were anonymized to maintain confidentiality throughout the research process.

D. Validity Data

The Validity data was established based on the criteria proposed by Lincoln and Guba (1985), comprising credibility, transferability, dependability, and confirmability. Credibility was strengthened through data triangulation and verification of the consistency of information obtained from the participants. Transferability was supported by providing contextual descriptions of the research setting and participants. Dependability was maintained through systematic documentation of the data collection and analysis processes, including interview transcripts, coding, categorization, and analytical decisions. Confirmability was established through researcher reflexivity and analytical documentation to ensure that the findings were grounded in the participants' data rather than researcher assumptions.

E. Data Analysis

The collected data was analyzed using the interactive model by Miles et al. (2014), which consists of data reduction, data display, and conclusion drawing/verification. Data analysis started right after each interview and continued iteratively throughout the research process. According to Miles et al. (2014) there are three activities in qualitative data analysis: data reduction, data display, and conclusion or verification.

To support the analysis process, the researcher used ATLAS.ti software as a tool to help organize the data systematically. The analysis began by importing interview transcripts, observation notes, and supporting documents into ATLAS.ti, followed by open coding to identify relevant units of meaning. The related codes were then grouped into categories, which were later developed into themes representing the research findings.

III. RESEARCH RESULT AND DISCUSSION

A. Teachers' Interpretation of Deep Learning in Physical Education

The findings show that Physical Education (PE) teachers don't see Deep Learning as a single, uniform concept. Instead, they shape its meaning through their teaching experience, professional development, self-learning, interactions with students, available resources, and the nature of movement-based learning. Even though there are differences among participants, their interpretations converge on some core ideas like meaningful learning, active student engagement, conceptual understanding, reflection, contextualization, and the connection between learning experiences and students' everyday lives.

An important finding is that teachers generally moved beyond understanding Deep Learning as simply increasing physical activity or varying teaching methods. They increasingly associated meaningful PE with helping students understand why an activity is performed, experience the learning process directly, reflect on their experiences, and recognize the relevance of physical activity to health and everyday life. In this sense, Deep Learning was interpreted as an orientation that integrates *mindful*, *meaningful*, and *joyful* learning rather than as a particular teaching model.

This finding is consistent with the broader conception of Deep Learning proposed by Fullan and Langworthy (2014), which emphasizes connecting knowledge with authentic contexts, collaboration, critical thinking, and the construction of meaningful learning experiences. It is also consistent with the principle of constructive alignment, in which learning activities should encourage students to actively construct meaning rather than merely reproduce information. The present findings extend these perspectives to PE by demonstrating that conceptual understanding can be constructed through movement experiences themselves.

However, the findings also reveal that teachers' interpretations remain uneven. Teachers with a more technical understanding tended to associate Deep Learning with active participation, varied activities, or the use of technology, whereas teachers with a more conceptual interpretation emphasized reflection, movement understanding, decision-making, contextual learning, and students' awareness of the meaning of physical activity. This distinction is important because teachers' interpretations constitute the foundation from which instructional decisions are made. The thesis data explicitly show that a partial interpretation may result in partial implementation, whereas a more contextual and reflective interpretation creates greater opportunities for meaningful implementation.

Thus, the findings support the teacher-cognition perspective that teachers are not passive recipients of curriculum policy. They actively interpret, negotiate, and translate educational concepts according to their existing professional knowledge and classroom realities. In the context of Deep Learning, this means that curriculum reform cannot be assumed to produce uniform pedagogical change simply because the policy has been disseminated. Professional learning needs to address not only what teachers should do, but also how teachers understand why those practices represent Deep Learning.

B. Implementation of Deep Learning in PJOK Lessons

The second major finding is about how teachers translate their interpretations into classroom practice. Five standout implementation patterns emerged: reinforcing concept understanding before practice, providing authentic movement experiences, using technology selectively, differentiating learning according to student needs, and applying authentic and reflective assessments. These practices show that Deep Learning isn't used as a single teaching method, but as a pedagogical orientation that influences planning, learning activities, and assessment.

One particularly important pattern was the provision of conceptual understanding before physical practice. Teachers attempted to ensure that students understood the objectives, benefits, procedures, movement principles, and safety considerations before performing an activity. This approach changes the nature of PE from mechanical repetition toward learning in which students understand the relationship between knowledge and movement. Such a finding is consistent with Biggs and

Reflection On the Interpretation and Implementation of Deep Learning by Physical Education Teachers at SMA Negeri Urban Java

Tang's conception of deep approaches to learning, in which learners actively connect ideas, construct meaning, and integrate knowledge through learning activities.

The findings also demonstrate the importance of authentic movement experiences. Teachers used games, direct practice, projects, sports events, and other activities that allowed students to experience learning directly. This is particularly relevant to PE because movement itself constitutes an important source of learning. The findings therefore support experiential approaches in which students move between concrete experience, reflection, conceptual understanding, and active experimentation.

Technology also appeared in the teachers' implementation strategies. However, the findings do not indicate that technology was treated as the essence of Deep Learning. Instead, teachers generally viewed digital technology as a supporting tool when it could improve learning effectiveness. This distinction is important because it prevents Deep Learning from being reduced to technology-based instruction. The teachers' reflective stance toward technology suggests that its pedagogical value depends on whether it contributes to students' understanding and learning experiences.

Differentiation was another important strategy. Teachers considered differences in students' physical ability, confidence, motivation, interests, and learning needs when designing activities. This finding indicates that meaningful PE requires teachers to recognize students as diverse learners rather than expecting all students to achieve through identical activities. In this regard, Deep Learning is expressed not simply through active participation but through the teacher's ability to create appropriate learning opportunities for different students.

Assessment was similarly expanded beyond physical performance. Teachers incorporated questioning, observation, feedback, reflection, and students' understanding of the meaning and benefits of activities. Such practices demonstrate an effort to align assessment with the broader objectives of Deep Learning. The findings therefore suggest that meaningful implementation requires coherence among what teachers understand, what students experience, and what teachers assess. Overall, the findings show that implementation is an adaptive process. Teachers translate Deep Learning into practices that are feasible within their particular school contexts. As the thesis concludes, effective implementation depends not only on teachers' conceptual understanding but also on their ability to translate that understanding into flexible, contextual, student-centered, and realistic learning activities.

C. Contextual Factors Supporting and Constraining Implementation

The third major finding demonstrates that Deep Learning implementation is shaped by a broader school ecosystem rather than by individual teacher competence alone. Supporting factors included institutional support, collegial relationships, school environment, sports facilities, internet and digital access, professional development, MGMP activities, mentoring, and supervision. At the same time, teachers reported constraints involving limited instructional time, shared facilities, weather, material rotation, differences in student characteristics, limited student motivation to move, uncontrolled gadget use, inadequate facilities, and injury risks.

Institutional and collegial support emerged as particularly important. Teachers were more able to develop and sustain new practices when school leaders, colleagues, MGMP networks, and supervisors provided direction, feedback, and opportunities for professional learning. This finding suggests that curriculum implementation is embedded within organizational conditions. Teachers' pedagogical innovation cannot be separated from the culture in which they work.

Facilities represented both an opportunity and a constraint. Some schools possessed relatively good access to sports fields, equipment, internet connectivity, and digital media, but their availability was not always consistent. Sports facilities could be shared, outdoor activities could be disrupted by weather, and specific equipment might not be available when required. Such constraints required teachers to modify activities rather than abandon the principles of Deep Learning. Professional development was another critical factor. The findings indicate that socialization, training, MGMP participation, and supervision supported teachers' understanding, but the depth and continuity of such programs remained important concerns. This finding is particularly significant because the thesis also identified uneven understanding of Deep Learning among teachers. Limited professional development can result in teachers interpreting Deep Learning primarily through familiar instructional practices rather than through its underlying pedagogical principles.

Interestingly, contextual constraints did not always function simply as barriers. Teachers frequently responded through adaptation and pedagogical creativity. For example, limitations in facilities or learning spaces could become opportunities for teachers to teach flexibility, cooperation, responsibility, and maturity. Thus, the findings suggest that contextual constraints can become pedagogically meaningful when teachers respond to them reflectively rather than merely treating them as technical obstacles.

Reflection On the Interpretation and Implementation of Deep Learning by Physical Education Teachers at SMA Negeri Urban Java

D. The Impact of Deep Learning on Students

The fourth major finding concerns the perceived impact of Deep Learning on students. Teachers reported improvements in learning enthusiasm, engagement, understanding of learning content, readiness for practice, independence, opportunities for expression, teacher–student relationships, health awareness, and attitudes toward physical activity. Importantly, these impacts were not limited to academic achievement or physical performance but were also visible in students' learning processes and attitudes.

Students were perceived as becoming more active and comfortable when learning involved direct experience and when theoretical concepts were connected with practice. This finding is particularly relevant to PE because students often encounter difficulty when abstract explanations are disconnected from physical experience. By connecting conceptual explanations with movement, teachers created opportunities for students to understand not only how to perform an activity but also why the activity matters.

Another important finding concerns students' independence and opportunities for expression. Deep Learning provided students with greater space to try activities, cooperate with peers, solve movement-related problems, make decisions, and evaluate their own learning. Such experiences extend the function of PE beyond physical training toward the development of cognitive, social, and reflective competencies. The findings also highlight health awareness as a particularly meaningful outcome. Teachers expected students to develop an understanding that physical activity is not merely a school requirement but an important component of lifelong health. Deep Learning was therefore perceived as successful when knowledge about healthy living was transformed into everyday behavior. Nevertheless, the findings caution against assuming that active and enjoyable learning is automatically beneficial. Teachers identified risks such as excessive student enthusiasm, potential injuries, inappropriate gadget use, and uneven teacher readiness. In PE, student-centered learning must therefore remain balanced with safety management, clear boundaries, and appropriate teacher guidance.

E. Reflections, Hopes, and Challenges of PE Teachers on Deep Learning

The final and most central finding concerns teacher reflection. The study indicates that reflection functions as a bridge between teachers' understanding of Deep Learning and their actual instructional practices. Teachers reflected on their ability to understand students, adapt teaching strategies, overcome resource limitations, evaluate learning experiences, and modify subsequent instruction. Reflection therefore emerged not merely as an activity conducted after teaching but as an ongoing professional process.

This finding is consistent with the concept of reflective practice developed by Dewey and Schön. Dewey (1933) conceptualized reflection as active and careful consideration of experience, while Schön (1987) positioned teachers as reflective practitioners who examine their actions both during and after practice. In this study, teachers demonstrated both forms of reflection: they made immediate pedagogical adjustments when encountering unexpected classroom conditions and subsequently evaluated the effectiveness of their instructional decisions. The reflective process also reveals that teachers did not simply implement Deep Learning according to a predetermined prescription. Instead, they continuously negotiated between curriculum expectations and classroom realities. Differences in student ability, facility availability, weather, time allocation, safety concerns, and technology use required teachers to make contextual decisions. Reflection enabled them to evaluate whether those decisions still supported meaningful learning.

A particularly significant finding is that reflection helped teachers recognize gaps between their initial understanding of Deep Learning and its broader pedagogical meaning. This suggests that professional reflection can function as a mechanism for conceptual development. Teachers who critically examine their own practices are better positioned to move from a technical interpretation such as “students are active” or “technology is used” toward a more substantive understanding involving conceptual learning, contextual relevance, student agency, and reflection. The findings further indicate that teachers expect Deep Learning to be sustained through continuous professional development. Teachers expressed the need for repeated, contextualized, and subject-specific training rather than one-time curriculum socialization. They also emphasized the importance of learning communities and technological development while maintaining the principle that technology should serve learning rather than become its primary objective.

Thus, reflection represents the central process connecting the major findings of this study. Interpretation determines the meaning teachers attach to Deep Learning, implementation translates that meaning into pedagogical action contextual factors shape the possibilities for action, perceived student responses provide feedback, and reflection enables teachers to reconsider and improve subsequent practice. This relationship provides a more comprehensive explanation of curriculum implementation than viewing Deep Learning solely as a set of instructional techniques.

IV. CONCLUSION AND SUGGESTION

A. Conclusion

This study concludes that the implementation of Deep Learning in Physical Education is shaped by the dynamic relationship between teachers' interpretation, pedagogical implementation, contextual conditions, perceived student responses, and professional reflection. Physical Education teachers generally interpret Deep Learning as a meaningful, student-centered learning orientation that emphasizes conceptual understanding, active and authentic movement experiences, reflection, contextual relevance, and the development of students' awareness of physical activity and health. However, differences in teachers' professional experiences and understanding result in variations in how Deep Learning is interpreted and implemented.

In practice, teachers translate Deep Learning through several adaptive strategies, including strengthening conceptual understanding before physical practice, providing authentic movement experiences, integrating technology selectively, differentiating learning according to students' characteristics, and applying authentic and reflective assessment. These practices demonstrate that Deep Learning is not implemented as a single instructional model but as a flexible pedagogical orientation adapted to the characteristics of Physical Education and the conditions of each school.

The implementation is also influenced by contextual factors. Institutional support, collaboration with colleagues, professional development, MGMP activities, supervision, facilities, and technological access provide important support, while limited instructional time, shared facilities, weather conditions, student diversity, limited motivation for physical activity, gadget use, and safety concerns create challenges. Teachers respond to these conditions through pedagogical adaptation and contextual decision-making.

Teachers perceived several positive changes among students, including increased engagement, enthusiasm, understanding of learning materials, independence, opportunities for expression, health awareness, and more positive attitudes toward physical activity. Nevertheless, these outcomes remain dependent on effective classroom management, teacher readiness, and appropriate attention to safety in physical activities.

Most importantly, teacher reflection emerges as a central process connecting interpretation and implementation. Through reflection, teachers evaluate their instructional decisions, recognize gaps between intended and actual learning, respond to contextual challenges, and adjust subsequent practices. Thus, Deep Learning in Physical Education should be understood not merely as the adoption of new teaching techniques but as a continuous process of pedagogical interpretation, contextual adaptation, and professional reflection.

B. Suggestions

Based on the findings, several suggestions are proposed. First, professional development programs for Physical Education teachers should provide sustained and contextualized opportunities to develop conceptual understanding of Deep Learning, rather than relying primarily on one-time curriculum socialization. Training should emphasize how the principles of Deep Learning can be translated into Physical Education planning, learning activities, assessment, and reflective practice.

Second, schools should strengthen professional learning communities through MGMP activities, peer collaboration, mentoring, and classroom-based reflection. Such collaborative environments can provide teachers with opportunities to exchange strategies, discuss implementation challenges, and critically examine their pedagogical decisions.

Third, school leadership and educational stakeholders should provide adequate facilities, technological access, instructional time, and institutional support to facilitate meaningful Physical Education learning. At the same time, teachers should continue developing adaptive strategies so that limitations in facilities, weather, time, and student characteristics do not prevent meaningful learning experiences.

Finally, future research should examine the implementation of Deep Learning in Physical Education across different school contexts and educational levels. Further studies may also combine teacher perspectives with classroom observations and students' perspectives to provide a more comprehensive understanding of how Deep Learning is experienced and enacted in actual Physical Education settings.

REFERENCES

- 1) Casey, A., & Kirk, D. (2020). *Models-based practice in physical education*. Routledge.
- 2) Casey, A., & MacPhail, A. (2018). Adopting a models-based approach to teaching physical education. *Physical Education and Sport Pedagogy*, 23(3), 294–310.
- 3) Dewey, J. (1933). How we think: A restatement of the relation of reflective thinking to the educative process.
- 4) Fullan, M., & Langworthy, M. (2014). *A rich seam: How new pedagogies find deep learning*. Pearson.

Reflection On the Interpretation and Implementation of Deep Learning by Physical Education Teachers at SMA Negeri Urban Java

- 5) Hamzah, R. A., Mesra, R., Karo, K. B., Alifah, N., Hartini, A., Agusta, H. G. P., Yusuf, F. M., Subroto, D. E., Febriyanti, F., Laila, L., Lisarani, V., Ramadhani, M. I., Larekeng, S. H., Tunnoor, S., A, R. B., & Titen Pinasti. (2023). *Strategi pembelajaran abad 21*. PT Mifandi Mandiri Digital.
- 6) Hattie, J., & Donoghue, G. (2016). Learning strategies: A synthesis and conceptual model. *NPJ Science of Learning*, 1(1), 1–13.
- 7) Korthagen, F. (2017). Inconvenient truths about teacher learning: Towards professional development 3.0. *Teachers and Teaching: Theory and Practice*, 23(4), 387–405.
- 8) Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry*. Sage Publications.
- 9) Loughran, J. J. (2002). *Developing reflective practice: Learning about teaching and learning through modelling*. Routledge.
- 10) Mahardika, Y., & Jaya, C. A. (2025). Persepsi guru terhadap penerapan Deep Learning dalam kerangka kerja pembelajaran mendalam. *Edukasiana: Jurnal Inovasi Pendidikan*, 4(3), 1123–1139.
- 11) Mezirow, J. (2000). *Learning as transformation: Critical perspectives on a theory in progress*. Jossey-Bass.
- 12) Miles, M. B., Huberman, A. M., & Saldaña, J. (2014). *Qualitative data analysis: A methods sourcebook* (3rd ed.). Sage Publications.
- 13) Pajares, M. F. (1992). Teachers' beliefs and educational research: Cleaning up a messy construct. *Review of Educational Research*, 62(3), 307–332.
- 14) Panadero, E. (2017). A review of self-regulated learning: Six models and four directions for research. *Frontiers in Psychology*, 8, 422.
- 15) Slingerland, M., & Borghouts, L. (2021). *[Use the complete bibliographic information recorded in the thesis]*.
- 16) Schön, D. A. (1987). Educating the reflective practitioner: Toward a new design for teaching and learning in the professions. Jossey-Bass.
- 17) Thornhill-Miller, B., Camarda, A., Mercier, M., Burkhardt, J. M., Morisseau, T., Bourgeois-Bougrine, S., & Lubart, T. (2023). Creativity, critical thinking, communication, and collaboration: Assessment, certification, and promotion of 21st century skills for the future of work and education. *Journal of Intelligence*, 11(3), 54.



There is an Open Access article, distributed under the term of the Creative Commons Attribution – Non-Commercial 4.0 International (CC BY-NC 4.0) (<https://creativecommons.org/licenses/by-nc/4.0/>), which permits remixing, adapting and building upon the work for non-commercial use, provided the original work is properly cited.