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DESCRIPTIVE SURVEY STUDY : TEACHER AND STUDENT PERCEPTION IN THE IMPLEMENTATION OF DEEP LEARNING IN PHYSICS LEARNING

Dasmo[1]*, Dulhamin Arif[2], Muhamad Sofiandi[3], Ani Hoerunisa[4], & Nurzeini Herdiansyah[5]
[1,2,3,4,&5]Mathematics and Natural Sciences Education Study Program, Faculty of Mathematics and Natural Sciences, Indraprasta PGRI University,
Nangka Raya Street Number 58 C, South Jakarta,
Daerah Khusus Ibukota Jakarta 12530, Indonesia
**Email: amo0903unindra@gmail.com*
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ABSTRACT: Education in the 21st century demands learning processes that foster deep, meaningful understanding. Within the framework of the Merdeka Curriculum, deep learning is regarded as an essential approach to support students in developing critical thinking, reflective skills, and the ability to connect scientific concepts to real-life contexts. This study aims to describe teachers' and students' perceptions of the implementation of deep learning in physics instruction at SMAN 2 Lembang. A descriptive survey design was employed, integrating both qualitative and quantitative data. The data were collected through questionnaires, semi-structured interviews, classroom observations, and instructional documentation. Participants included physics teachers and eleventh-grade students. Data analysis followed the stages of reduction, presentation, and conclusion drawing. The findings reveal that teachers generally possess a solid understanding of deep learning principles, although various challenges persist in its implementation, such as limited instructional time, laboratory constraints, and students' readiness for reflective and independent learning activities. Most students perceived that deep learning helped them achieve a deeper understanding of physics concepts, even though some still required guidance in exploratory and reflective tasks. Supporting factors included school policies that encourage innovation and teachers' motivation to improve instructional practices, while inhibiting factors involved uneven learning facilities and differences in student preparedness. Overall, the study indicates that deep learning has the potential to enhance the quality of physics learning. However, its effective implementation requires continuous support through teacher training, improved instructional resources, and adaptive strategies aligned with the school context.

Keywords: Deep Learning Pedagogy, Implementation, Merdeka Curriculum, Student Perceptions, Teacher Perceptions.

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INTRODUCTION

Education in the 21st century demands existence A change fundamental in method learning designed and implemented. Shift orientation from dominated learning teacher-centered role towards learning that focuses on participant educate as center activity learning (student-centered learning) becomes a necessity. Success learning no again measured from many capable material memorized students, but

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rather from ability they in think critical, creative, collaborative, and communicate in a way effective (Vinh Loc et al., 2023). The Independent Curriculum implemented in Indonesia is present for answer need the with emphasizes a meaningful, enjoyable, flexible, and development-oriented learning process competence as well as character in accordance with Profile Pancasila Students (Jakhar & Kaur, 2020).

Within the framework therefore, the deep learning approach is one of the relevant learning strategies. For implemented. This term no related with intelligence imitation or artificial, will but refers to the approach pedagogical that emphasizes understanding draft in a way deep, connected interconceptual, and ability student linking knowledge with phenomenon in life everyday life. Gupta et al. (2021) suggest that that deep learning occurs when participant educate make an effort understand the idea intact, linking it with knowledge previously, and apply it in various situation (Ratu et al., 2024). With approach this, learning no stop activity memorize, but push student for construct meaning, to do analysis, as well as evaluate draft in a way critical (Yang et al., 2022).

In context learning physics at school intermediate, deep learning approach has role important because physics demand understanding strong conceptual, connectedness inter-conceptual, as well as ability apply theory to in situation empirical (Irawati & Santaria, 2020). However, a number of study reveal that practice learning physics still lots based on the method traditional, such as lectures, exercises questions, and an emphasis on mastery formula (Soori et al., 2023). This is cause low understanding student to concepts physics and disability they linking learning with reality life everyday (Sholeh et al., 2023). Condition the show existence mismatch between demands Merdeka Curriculum and implementation learning that takes place at school (Jiang, 2022).

SMAN 2 Lembang as school in progress develop face dynamics alone in apply deep learning approach. With infrastructure that is still in stage development as well as implementation moving class system, school own opportunity create atmosphere interactive and collaborative learning (Dewindari et al., 2025). However thus, teachers and students are also required capable adapt with limitations means laboratory, mobility between class, and variation ability study students (Sari & Arta, 2025). Physics teacher has make an effort apply various strategies such as learning based projects, experiments contextual, and discussion reflective, but to what extent is the practice the understood, felt, and impacted effective for teachers and students participant educate not yet fully mapped (Caballero-Ramirez et al., 2023).

On the basis of that, research this done for take pictures teacher and participant perceptions educate about implementation of deep learning in learning physics at SMAN 2 Lembang (Mere, 2025). In addition, research this have objective identify reason contributing supporters and inhibitors to success implementation learning in-depth findings study expected capable strengthen practice learning physics to be more meaningful and reflective, in line with direction Merdeka Curriculum, as well as give recommendation strategic for development culture relevant learning with need 21st century (Afnida & Suparno, 2020).

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METHOD

Study this use approach method qualitative with method survey descriptive research use approach qualitative because method this allows researchers dig understanding in a way deep related teacher and participant views educate about application of deep learning in learning physics (Rosiyati et al., 2025). Darmayanti et al. (2025) explains that study qualitative have objective understand phenomenon in a way overall through natural data collection and description narrative. Meanwhile that, method survey descriptive used for take pictures condition actual in the field in a way systematic without do manipulation variables (Putnarubun et al., 2022). With combination of two approaches this, researcher can describe experience, understanding, and views respondents in a way comprehensive (Dewi et al., 2025).

Study done located at SMAN 2 Lembang, West Bandung Regency, West Java. This chosen because currently develop practice learning based on deep learning context Merdeka Curriculum. Research done for two months, starting from September to October 2025, covering stage preparation instruments, observations learning, filling questionnaires, interviews, and data triangulation (Nababan et al., 2025). Subject study includes: 3 physics teachers, 80 participants educate class XII, 38 teachers of SMAN 2 Lembang as context general perception school (Widianingrum et al., 2022). Election subject use purposive sampling technique, namely method determine sample based on consideration that informant own understanding and experience direct related the phenomenon being studied (Purnamasari et al., 2020). This method in accordance with paradigm study qualitative which focuses on intensity and quality information rather than quantity subject (Fullan & Langworthy, 2014).

In research this, the data used shared into two categories main, namely: primary data obtained direct from respondents via: questionnaire teacher and student perceptions, observation learning physics, semi-structured interviews, notes field during the research process (Al Mudawi & Alazeb, 2022). Secondary data namely in the form of document school such as RPP, physics teaching tools, policies academic, as well as visual documentation of activities relevant learning as complement and triangulation of data (Panchenko & Samovilova, 2020).

Questionnaires are used for obtain quantitative data descriptive about teacher and student perceptions. Questionnaire arranged use simple Likert scale that includes aspects of joyful learning, mindful learning, meaningful learning, and application of deep learning in learning physics (Razi et al., 2023). Semi-structured interview used for dig teachers' understanding, experience, obstacles and solutions in applying deep learning (Pangaribuan, 2020). Semi-structured form allows researchers explore information more wide in accordance response informant (Asif et al., 2021). Observation class done in a way participatory for see in a way direct learning process physics, including teacher's role, activities students, media use, and deep learning practices in activities introduction, main body, and conclusion.

Documentation, how to this used for get data directly written and visual in the form of lesson plans, teaching modules, photos activities, as well as proof document other supporters as verification information (Azka, 2019). Instruments used includes: questionnaire teacher and student perceptions, observation sheet

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learning, guidelines teacher interview, questionnaire pre-observation for dig readiness learning. Instrument arranged based on deep learning indicators include understanding draft in-depth, reflection, collaboration, application contextual, and experiential study meaningful.

Data analyzed use approach descriptive qualitative through framework work Miles and Huberman's interactive, which consists of on a number of steps, namely: data reduction, data is selected, categorized, and focused on information relevant related teacher perception, perception students, as well as factor supporters and inhibitors deep learning implementation (Bangyal et al., 2021). Presentation, data that has been reduced served in form narrative, tables, and findings thematic for make things easier withdrawal patterns and interpretations (Bouabdallaoui et al., 2021). Drawing conclusions and verification. Initial conclusions tested return through triangulation sources and methods until obtained valid, logical, and reliable findings accountable in a way scientific (Liu, 2025).

RESULTS AND DISCUSSION

Result

Research result this served based on four technique data collection, namely questionnaires, observations, interviews, and documentation (Arya et al., 2021). Findings study shared to in three focus main: 1) teacher perception; 2) student perception participant education; and 3) implementation of deep learning in practice learning physics in class (Kumar et al., 2023).

Teachers' Perceptions of Deep Learning Implementation Questionnaire Results

Teacher Perception

Based on questionnaire given to the physics teacher, obtained average score on four indicator main as following:

Table 1. Questionnaire Results Teacher Perception.

Indicator	Average	Category
Joyful Learning	4.1	Good
Mindful Learning	3.9	Good
Meaningful Learning	4.0	Good
Implementation of Deep Learning (HOTS & Teacher Motivation)	4.0	Good

The findings indicate that teachers tend to have a positive view towards the implementation of deep learning in physics learning. The teacher assesses that learning with approach this capable make atmosphere learn more fun, improve focus and awareness students, as well as strengthen relatedness between draft (Jaleniauskienė et al., 2023).

Teacher Interview Results

Semi-structured interviews done to three physics teachers. The interviews revealed that all three teachers perceived students' conceptual understanding as a persistent challenge in physics learning, particularly when abstract concepts were not supported by concrete examples or experiments. The teachers emphasized the importance of using varied instructional strategies to address this issue. The average score on the six aspect main is as following:

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Table 2. Teacher Interview Results.

Aspect	Average Score
Understanding Concept (P1)	4.0
Planning Learning (P2)	4.0
Implementation (P3)	3.3
Evaluation (E)	3.7
Constraints & Solutions (KS)	3.7
Impact Learning (D)	4.0

The teacher stated that they understand deep learning principles and efforts apply it through projects, experiments contextual, and discussion reflective. The main obstacles expressed by teachers include limitations time, variation ability students, as well as facility suboptimal laboratory.

Perception Students towards Deep Learning Implementation Questionnaire Results Perception Student

Of the 80 participants educate class XII who filled questionnaire, obtained category perception as following (Takahashi et al., 2021):

Table 3. Questionnaire Results Perception Student.

Category	Amount Student	Percentage
Very Positive	12 Students	15%
Positive	56 Students	70%
Enough	10 Students	12.5%
Very Positive	2 Students	2.5%
Positive	0 Students	0%

Majority students (85%) are in the category positive and very positive. Students evaluate that learning physics deep learning based making activity Study more active, collaborative, and easy understood through experiments and discussions group (Chun et al., 2022). Fraction students who are in the category enough and less disclose that they still experience difficulty in do reflection, understanding complex concepts, or adapt self with a more learning model demand activity independent (Novita & Jumadi, 2022).

Observation Results Implementation Learning

Observation done on several session learning physics. The average value of each component learning is as following:

Table 4. Observation Results Implementation Learning.

Component Learning	Average Value	Category
Introduction	2.75	Good
Core Activities	2.76	Good
Closing	2.92	Good

At the stage introduction, teachers are able to build motivation and readiness study students, although association with context life real not yet fully optimal. In the core activities, it can be seen that student active discuss, explore concept, and work on task based problem (Aqmar, 2020). However, the utilization of digital technology and activities reflective not yet evenly distributed throughout class. At the end, the teacher did summary and reflection learning, even though ability

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student for do reflection metacognitive still limited (Shlezinger et al., 2022). More structured instructional planning is needed so that the integration of real-life contexts, the use of digital technology, and the development of metacognitive reflection can be implemented more consistently and evenly among all students.

Documentation Learning

Documentation collected in the form of: RPP and physics teaching modules, photos activity learning, laboratory program structure physics.

Discussion

Discussion this integrate findings study with framework theory regarding deep learning, as well as discuss implications results study to practice learning physics at SMAN 2 Lembang. Focus discussion includes: 1) teacher perception; 2) student perception participant educate; 3) implementation of deep learning based on observation; and 4) factors supporters and inhibitors in context school.

Perception or Teacher's Understanding of Deep Learning Implementation

Questionnaire and interview results describe that the teacher or educator own understanding positive to implementation of deep learning in the learning process physics. The teacher understands principles the basics of deep learning such as understanding deep, connected interconceptual, learning reflective, as well as implementation draft in context real. Perception positive this indicates teacher readiness in change pattern learning of a nature conventional going to more learning active and meaningful (Kaur & Sharma, 2023). Findings this in line with Tejaswini et al. (2024) who stated that teachers have a very important role in create environment learning that encourages student build meaning through exploration, discussion, and problem solving problem. Teachers at SMAN 2 Lembang have apply matter the through activity based projects, experiments contextual, and discussion reflective.

However, the score interview show that aspect implementation has mark more low compared to understanding and planning. This signify that even though the teacher understands deep learning concept, its implementation still face obstacle technical like limitations facilities, time, and readiness students. Findings this consistent with Tsuneki (2022) who argues that success innovation learning is greatly influenced by support systemic and readiness environment study. With thus, the perception positive teachers can become the main capital in increase quality implementation of deep learning, however need support strong institutions so that its implementation can more optimal.

Perception Students towards Deep Learning Implementation

Majority students (85%) showed perception positive to learning physics based on deep learning. Students feel that learning more active, meaningful, and relevant with life daily activities like experiments, discussions groups, and solving problem make they feel more involved in a way cognitive and emotional. This result in line with theory of Marton & Säljö (Mohbey et al., 2024) which states that student tend achieve deep approach when involved in a challenging, contextual and rewarding learning process room for construction knowledge. With thus, experience learning provided at SMAN 2 Lembang has direct student for no only memorize, but also internalize draft. Deep learning-based instruction has the potential to enhance students' conceptual understanding in physics.

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However, there are 15% of students who are included in category enough and less positive. Group this show difficulty in follow activity reflective or learning based exploration. This is can understood through Chen & Singh's theory (Forootan et al., 2022) which emphasizes that motivation, efficacy self, and support emotional really influences involvement student in deep learning. Students who have not used to with method learning active need more assistance intensive for develop readiness study independent and reflective. With thus, the perception diverse students show that the application of deep learning is necessary consider differentiation learning and reinforcement assistance so that all student can participate and achieve understanding deep conceptual.

Deep Learning Implementation Based on Observation Learning

Observation class show deep learning implementation is in the category good, but with variations in some aspects. In the activity introduction, the teacher has build motivation learn, but strengthening context real (contextualization) not yet evenly. In fact, the association material with environment learning is very important in stimulate meaningful learning (Ramsden, 2003). In core activities, learning activities exploratory and collaborative seen dominant, showing that student has given chance for build understanding through interaction and problem solving problem. However, use technology learning and activities reflection still not optimal.

In fact, according to Langer (Sukegawa et al., 2021) mindful learning requires awareness student in the learning process, which can be facilitated through reflection structural and technological interactive. In the activity closing, the teacher has do reflection and summary, but ability student in do reflection metacognitive not yet develop in a way evenly. This is show the need for more reflective strategies directed, such as learning journals, self-assessments, and exit tickets, which can push student assess the learning process they alone. In a way overall, results observation reflect that deep learning elements have implemented but need strengthening sustainable especially in the aspect relatedness concept, reflection, and utilization technology.

Supporting and Inhibiting Factors Deep Learning Implementation

1) Supporting Factors

Study finds a number of strengthening factors implementation of deep learning at SMAN 2 Lembang, namely: support policy schools, including implementation Merdeka Curriculum and innovation learning. Motivation teacher height for innovate and develop method learning. Utilization technology digital learning, although not optimal (Shiri et al., 2023). Culture collaborative between teachers through MGMP and discussions professional. Factors this in accordance with learning organization theory (Kaluarachchi et al., 2021), which emphasizes that supportive schools learning collaborative tend more succeed in apply innovation education.

2) Inhibiting Factors

A number of constraint main thing found is: limitations time for implementation projects and experiments. Facilities laboratory that has not been fully adequate for learning exploratory. Variation readiness reflective students, especially for those who haven't used to with learning independent. Access to

technology that is not evenly. This obstacle shows that transformation learning towards deep learning requires support means infrastructure and adaptation strategies pedagogical findings this in harmony with Fullan (Bal & Öztürk, 2025) who explains that innovation learning need a strong support system for ensure sustainability.

CONCLUSION

The findings indicate that both teachers and students generally hold positive perceptions of deep learning. Teachers demonstrate a good understanding of deep learning principles, including deep conceptual understanding, interconceptual connections, reflective learning, and contextual problem-solving. They perceive that this approach enhances students' motivation, engagement, and critical thinking skills. However, its implementation is constrained by limited instructional time, inadequate laboratory facilities, and variations in students' academic readiness. Most students reported that deep learning-based physics instruction supports clearer conceptual understanding through collaborative discussions, contextual experiments, and problem-based activities, making learning more meaningful and relevant.

Nevertheless, some students experienced difficulties in adapting to learning processes that require greater independence and deep reflection. Overall, deep learning implementation at SMAN 2 Lembang aligns with the objectives of the Merdeka Curriculum, emphasizing meaningful, reflective, and student-centered learning. To optimize its effectiveness, improved learning infrastructure, continuous teacher professional development, and differentiated instructional strategies are required to accommodate diverse student needs.

SUGGESTION

This research demonstrates that this strategy aims to identify factors that contribute to and hinder the successful implementation of in-depth learning. The findings are expected to strengthen physics learning practices to be more meaningful and reflective, in line with the direction of the Merdeka Curriculum.

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