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Geography Teachers' Perceptions and Attitudes Toward Paradigm Shifts in Learning Through Deep Learning Approaches

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ABSTRACT

This study explored geography teachers' perceptions and attitudes toward the paradigm shift in learning through the Deep learning approach within Indonesia's Merdeka Curriculum. Using a convergent mixed-methods design, data were collected from 50 geography teachers across West Java through structured questionnaires and open-ended responses. Quantitative data were analyzed using descriptive statistics, while qualitative data were examined through thematic analysis. The results showed that most teachers had positive (56%) or very positive (28%) perceptions of Deep learning, although conceptual understanding remained moderate. Attitudinal responses were even stronger, with 52% of participants exhibiting very positive attitudes, particularly in terms of motivation, collaboration, and willingness to adapt. However, teachers expressed concerns about their readiness, challenges in lesson design, student learning habits, technology integration, and inadequate school infrastructure. Despite these obstacles, the findings suggest a strong professional commitment to adopting Deep Learning approaches, provided that sufficient training and institutional support are available. The study contributes to a deeper understanding of how subject-specific educators respond to curricular innovations and emphasizes the importance of equipping teachers for sustainable implementation. In addition, support from school principals and policymakers is highly expected to create a conducive and equitable learning environment. This research provides important recommendations for the development of educational policies and practices that are able to support meaningful and sustainable learning.

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1. INTRODUCTION

The changes that occur continuously in the education system in Indonesia are not without reason, because every change hopes to be for the better. The curriculum which is the heart of learning must always be developed and adjusted so that it can face various challenges that occur at this time and in the future that are difficult to predict. Education Transformation is one way to answer every educational challenge faced so that quality and equitable education can be realized in Indonesia. In addition, with existing technological advances, education must always keep up with the developments and needs of the times. In line with what Roshid, M. M., & Haider, M. Z. (2024) "The 21st-century world calls for its citizens' relevant formulaic knowledge and skills to ensure, achieve, and sustain success." when looking at the statement that the needs of the times are in line with the goal of Deep learning which is not only gaining knowledge but also skills is something that must be paid attention to and given to students.

Currently, there are still two curricula that apply in Indonesia, namely Curriculum 13 and the Merdeka curriculum. The Ministry hopes that all schools in Indonesia will be able to implement an Merdeka Curriculum at the latest in the 2026/2027 school year. When referring to the Regulation of the Minister of Education and Culture (Permendikbudristek) No. 12 of 2024, the curriculum set for now is an Merdeka Curriculum with a deep learning approach. The context of Deep learning is not a new curriculum but a learning approach, for the education system in Indonesia itself, the learning approach is not something new because it has been often applied before. Its application began in the 1970s with the introduction of an approach to learning How to Learn Active Students (CBSA), then changed to Creative Effective and Fun Active Learning (PAKEM), then Innovative Creative Effective and Fun Active Learning (PAIKEM), and finally Contextual Teaching and Learning (CTL). However, from each of these approaches, there are still many obstacles both at the conceptual level and during implementation. Therefore, Deep learning is expected to function as the main foundation for improving the learning process and quality.

Deep learning according to (Suyanto, D., et al. 2025) "Is an approach that emphasizes the creation of a learning atmosphere and learning process that is conscious, meaningful, and joyful through thought, heart, taste, and sports in a holistic and integrated manner". The deep learning principle consists of mindful, meaningful, and joyful. The deep learning framework consists of four components, namely (1) the dimension of the graduate profile, (2) the learning principles, (3) the learning experience, and (4) the learning framework. The profile of graduates consists of eight dimensions, namely (1) faith and piety to God Almighty, (2) citizenship, (3) critical reasoning, (4) creativity, (5) collaboration, (6) independence, (7) health, and (8) communication. The dimension of the graduate profile is a complete competency that must be possessed by every student after completing the learning and education process (Suyanto, D., et al. 2025). Deep learning, is inseparable from technology, The ultimate goal would be to alter whole education systems by getting the vast majority of members to use pedagogy and technology in new and integrated ways to achieve a new vision of Deep learning (Fullan & Langworthy 2014). Some countries have applied the principles of deep learning such as the United Kingdom, Finland, Germany, Australia, Japan, South Korea, and several other countries by creating learning that is conscious, meaningful, and exhilarating. Some countries implement inclusive learning to create comfort for students to participate in achieving their competencies.

The integration between the Merdeka Curriculum and Deep learning is also an important concern. Experts assess that collaboration between the two can create adaptive and innovative learning (Hayu, R., & Suciptaningsih, O. A. 2024). To ensure the effectiveness and efficiency of the implementation of deep learning in the context of education in Indonesia, teachers are needed who are the main actors in implementing deep learning in educational units. Therefore, it is necessary to implement policies and recommendations related to the role of teachers, subject-

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based, cluster, interdisciplinary, and even transdisciplinary approaches contextually. In its implementation, the success of the Deep learning Curriculum is highly dependent on the perception and understanding of teachers as teachers (Hatim, M., 2018). Previous studies have shown that the implementation of the new curriculum is often faced with various challenges, including a lack of understanding of teachers, limited resources, and institutional support (Ningsi, A., et al., 2024).

There is no exception to the teachers who teach geography subjects in schools that are the target of current research. Contextually, deep learning is very good to use in geography subjects because it can encourage students to understand the complex relationship between humans, space, and the environment based on creative, analytical, and applicative thinking patterns that are in line with the development of the times and the digital era. This study aims to find out how geography teachers' reactions to the transition of the Merdeka Curriculum change using the Deep learning approach and explore the attitude of geography teachers towards the change in the Deep learning paradigm. So with this research, it can be found out the obstacles, challenges, and needs faced by geography teachers in the implementation of Deep learning so that it can be implemented properly in schools.

This study offers a novel contribution by focusing specifically on geography teachers' perceptions and attitudes toward the paradigm shift to deep learning within the Merdeka Curriculum. While previous research has generally examined the implementation of curriculum reforms or teacher readiness in a broad sense (Ningsi et al., 2024; Loyd et al., 2020), this study uniquely explores the affective, cognitive, and professional responses of geography teachers, whose subject demands contextual, spatial, and critical thinking skills (Naidoo, 2021). Conducted in the context of ongoing educational transformation in Indonesia, this research fills a gap in the literature by providing empirical insights into teacher-level responses to pedagogical shifts, which are essential for successful and sustainable curriculum implementation (Fullan & Langworthy, 2014). It is also expected to produce practical implications not only for geography teachers but also for educators, policymakers, and institutions seeking to strengthen the implementation of deep learning-based curricula. By examining teachers' perceptions and attitudes in depth, this study helps ensure that resulting educational policies are better aligned with the needs and realities of classroom practice, supporting evidence-informed decision-making. This research also serves as a foundation for generating more targeted strategies for professional development and institutional support. Given the increasing global emphasis on deeper learning competencies (Esteban-Guitart & Gee, 2020; Warburton, 2003) and the urgent need to align teacher practices with curriculum innovation, this topic is essential to investigate, particularly in geography education, which inherently requires interdisciplinary, critical, and transformative pedagogical approaches.

2. METHODS

This study employed a convergent mixed-methods approach to examine geography teachers' perceptions and attitudes toward deep learning. A total of 50 active geography teachers were selected using simple random sampling from the MGMP in West Java. The mixed-methods approach was chosen to enrich the interpretation of quantitative survey results with qualitative insights from open-ended responses, aligning with Creswell, J. W., & Plano Clark, V. L. (2018) framework for mixed methods in educational research. To illustrate the geographical scope of the study and ensure representativeness, the distribution of participants was mapped across of West Java.

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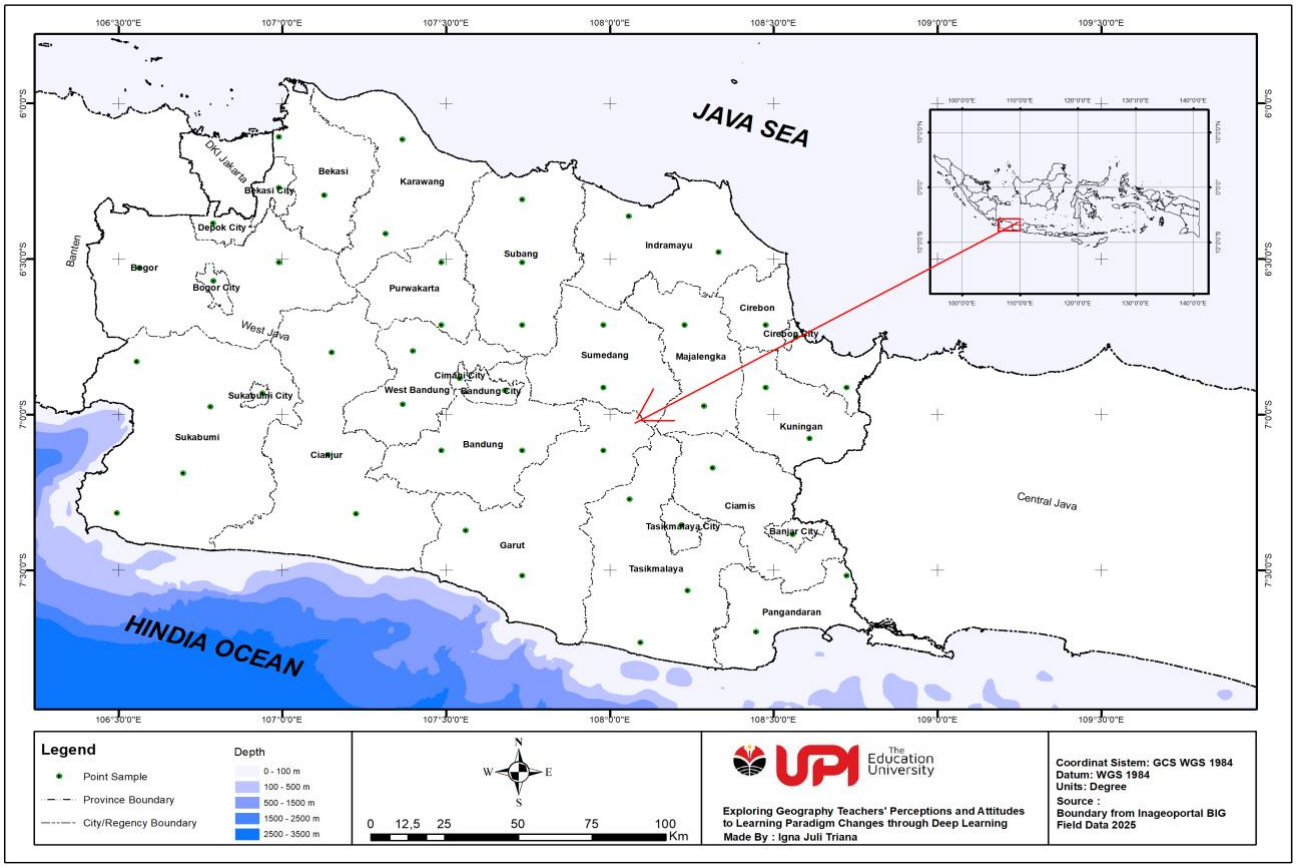
This study involved one independent variable and two main dependent variables. The independent variable was the paradigm shift in learning through the Deep learning approach. The dependent variables were teachers' perceptions and attitudes. Teachers' perceptions were measured through four aspects: conceptual understanding, contextual relevance, student impact, and external support. Attitudes were assessed through commitment, professional readiness, collaboration, and response to challenges. Moderating factors such as prior training and school infrastructure were also considered, along with control variables like age, teaching experience, and certification. The study area and sampling distribution can be seen in **Figure 1,** a study area map and sampling distribution chart are provided to show the spatial coverage and balance of respondents, enabling clearer contextual interpretation of the findings.

Figure 1. Study Area and Sampling Distribution



Source: Research 2025

Data were collected through a Google Form-based questionnaire, which consisted of Likert-scale items (1 = strongly disagree to 5 = strongly agree), demographic items, and open-ended questions. The instrument was reviewed by geography education experts for content validity and adapted from constructs used in recent deep learning and teacher perception studies (Naidoo, 2021; Khotimah & Abdan, 2025). Quantitative data were analysed using descriptive statistics (frequencies, means, percentages), while open-ended responses were examined using thematic analysis based on coding and pattern identification techniques recommended by Braun, V., & Clarke, V. (2019). This dual approach allowed for a deeper understanding of both measurable trends and nuanced teacher reflections.

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3. RESULTS AND DISCUSSION

This research was conducted by analyzing survey answers from 50 respondents who are active geography teachers spread across various regions. All respondents were high school teachers who were members of MGMP Geography. From the results of the research survey, the average respondent is in the age range of 25-35 years and has been teaching geography for 5-10 years. Around 66% of respondents already have educator certification obtained by participating in PPG so most of the respondents are teachers who have competence and are professional in their fields. All respondents know that there is currently an education transformation which refers to the Regulation of the Minister of Education and Culture (Permendikbudristek) No. 12 of 2024 that the curriculum set for now is an Merdeka Curriculum with a deep learning approach. However, only about 22% have participated in Deep learning training. So only 10% of respondents have tried to apply Deep learning to learning, the remaining around 90% or 40 people have not applied Deep learning to geography learning in the classroom and they plan to implement Deep learning in the new school year in 2025/2026. Because most of them have not implemented Deep learning, researchers need to know how the perception and attitude of geography teachers towards this learning transition so that it is hoped that it will help all the limitations, obstacles, and needs faced by geography teachers in its implementation. The results of the research on teachers' perceptions and attitudes are as follows.

3.1 Teacher's Perception

To find out the results of the analysis of geography teachers' perceptions of Deep learning conducted by a study on 50 geography teachers are shown in **the following Table 1**.

Table. 1 Geography Teacher's Perception

Score Range	Category	Number of Teachers	Percentage
41–50	Very Positive	14	28%
31–40	Positive	28	56%
21–30	Negative	6	12%
<20	Very Negative	2	4%

Source: Research 2025

Referring to table.1 which is a table of the results of the analysis of geography teachers' perceptions, shows that around 28% of teachers have a very positive perception, 56% of teachers show positive perceptions which is the category with the highest number, 12% of teachers are in the negative category and around 4% show a very negative perception of this Deep learning transition. The average score is in the range of 36.76 out of 50 which is included in the positive category which shows in general the positive perception of teachers towards Deep learning. The results of the interpretation of the study are shown in **Table 2** as follows.

Table. 2 Interpretation of Teacher Perception

Aspects	Mean	Category
Concept Understanding	3.22	Neutral
Contextual Relevance	4.23	Agree
Impact on Students	4.19	Agree
External Support	3.47	Neutral

Source: Research 2025

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Teachers' perceptions of deep learning are interpreted by researchers with several aspects, the first aspect is understanding concepts, contextual relevance, impact on students, and external support. In understanding the concept, the researcher focuses on knowing the teacher on understanding the definition, characteristics, and principles of Deep learning. The aspect of teachers' concept understanding showed an average score of 3.22 which is a neutral category that shows doubts and a lack of teachers understanding concepts. In the aspect of contextual relevance, the researcher provides indicators to determine the suitability of Deep learning with the Merdeka curriculum and geography subjects in particular. For this aspect, an average score of 4.23 indicates the category of agree, which means that in this aspect teachers agree that Deep learning is suitable when applied to the Merdeka curriculum and especially implemented in geography learning in the classroom. The aspect of impact on students includes the teacher's perception of the impact of Deep learning on learning outcomes and student character in this aspect with an average score of 4.19 which shows that teachers agree that the application of Deep learning will have a good impact on learning outcomes and shape students' character for the better. The last is external support where the researcher wants to know about the readiness of infrastructure, media, and school support for the implementation of Deep learning, from the results of the analysis show a value of 3.47 which is neutral or there is still a lack of external support for teachers for the implementation of Deep learning so that teachers still have some shortcomings or obstacles to the aspect of external support.

From the results **of Table.1** analysis of geography teachers' perceptions of Deep learning, the average score is in the range of 36.76 out of 50 which is included in the positive category which shows in general the perception of teachers is positive towards Deep learning. The results of the interpretation of the study are shown in **Table.2** In general, teachers' perceptions of Deep learning have a positive perception, for understanding the concept itself gets a fairly low score compared to other aspects and is in the neutral category, this shows that there are still many who do not understand the concept of Deep learning such as understanding the definition, characteristics, and principles of Deep learning in the Merdeka Curriculum itself is considered lacking. Therefore, the importance of increasing teachers' understanding of socialization activities, or training, is in line with previous research that emphasizes the importance of teachers' understanding of the new curriculum as a key factor in successful implementation (Loyd, C., et al., 2020).

They also stated that deep learning has relevance to the Merdeka curriculum, especially in geography subjects based on spatial analysis, and can have an impact on learning outcomes and high thinking skills in students. Various studies have also shown that the use of deep learning in education can increase learning effectiveness, increase student motivation, and help teachers identify students' learning needs more accurately. Research by (Khotimah & Abdan, 2025) in line with Wang et al. (2021) applied deep learning theory to instructional design, and the results showed that the new teach- Ing approach achieved high satisfaction levels, as well as improved student performance. In terms of external support, which includes infrastructure readiness, media, and support from schools, it is in the neutral category with a score of 3.47, showing that support is still relatively low. Such as the support of the principal as the leader of policymakers in the school. Teachers can also involve their families, communities, or communities as partners who provide support and authentic context in optimal deep learning (Suyanto, D., et al. 2025). In addition to knowing the teacher's perception, the researcher also wanted to know the teacher's attitude towards the transition of learning changes, the results of the research are shown in **Table. 3** as follows.

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3.2 Teacher's Attitude

To find out the results of research and analysis of geography teachers' attitudes towards changes in the Deep learning paradigm, it is shown in **Table 3** as follows.

Table. 3 Attitudes of Geography Teachers

Score Range	Category	Number of Teachers	Percentage
41–50	Very Positive	26	52%
31–40	Positive	21	42%
21–30	negative	1	2%
<20	Very Negative	2	4%

Source: Research 2025

Table 3 shows that the attitude of geography teachers towards the change in the Deep learning paradigm is shown by 52% around 26ofers who in the category of very positive attitudes, another 42% teachers of are in a positive category and the rest only about 6% are divided into the negative category of 2% and very negative 4%. **Table 3**, produces an average score of 41.58 which is classified as very positive, so this shows that teachers have high enthusiasm, openness, and readiness for the application of Deep learning. As for the results of the interpretation of the teacher's attitude, more detail is shown in the **following Table.4**.

Table. 4 Interpretation of the Teacher's Attitude

Aspects	Mean	Category
Commitment and Motivation	4.28	Agree
Professional Readiness	3.84	Agree
Collaboration and Support	4.24	Agree
Response to Challenges	4.19	Agree

Source: Research 2025

Geography teachers' attitudes towards the change in the Deep learning paradigm are divided into several aspects, namely commitment and motivation, professional readiness, collaboration, and support as well as response to challenges. In the first aspect, commitment and motivation are indicators of the teacher's willingness to change and develop themselves to be able to implement Deep learning and in this aspect produce an average score of 4.28 which is included in the category of agree. The second aspect is professional readiness which has indicators of the level of readiness, competence, and confidence of teachers towards Deep learning resulting in an average score of 3.84 with the category of agree, but including the highest score from all aspects of attitude. The third is collaboration and support which is an indicator of teachers' views on the importance of collaboration and institutional support showing an average score of 4.24 which is in the agree category. The last response to the challenge is the attitude of the teacher in facing obstacles and learning innovations, the response to this challenge shows an average result of 4.19 which is contained in the category of teachers having an agreeable attitude.

In **Table 3**, the attitude of geography teachers towards the change in the Deep learning paradigm resulted in an average score of 41.58 which is classified as very positive. This is it. Showing that teachers have high enthusiasm, openness, and readiness for the application of Deep learning. The results of the interpretation shown by **Table 4** explain that the teacher's commitment and motivation are the highest scores compared to other aspects, showing that teachers have the will to change and are willing to develop themselves for the sake of deep learning. For the aspect of collaboration and support, the teacher's view agrees that it is important

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to collaborate with various parties and with the support of schools to improve the ability in the implementation of Deep learning. They also respond well in facing all challenges and challenges and will continue to innovate in learning. Although the previous aspect looks positive, the aspect of professional readiness gets a lower score compared to other aspects, this shows that the level of readiness, competence, and teacher confidence is lower than other supporting aspects. So, this shows that they are still doubtful about their ability to apply Deep learning to learning.

3.3 Supporting Qualitative Results (open-ended questions)

In this study, the author also made several open-ended questions to support the results of the research. The first is to find out what will be the challenges that will be faced and the support needed for teachers in implementing Deep learning in geography learning in particular. The results that are considered as challenges to be faced are as follows:

1) Learning Plan
   Respondents feel that they will have difficulty in making learning plans that implement Deep learning. For example, determining learning models and methods that must be adjusted, especially in geography learning which has complex learning topics and requires a contextual approach so that learning design must be meaningful, fun, and encourage critical thinking is quite difficult to apply.
2) Characteristics and conditions of students
   Respondents felt that the conditions and characteristics of students were still accustomed to confessional learning which was still centered on teachers while Deep learning was centered on students and there was still a lack of student literacy which showed a lack of student motivation.
3) Integration of Technology into Learning
   Lack of teachers' ability to use technology for learning and the limited availability of digital learning resources that support the implementation of Deep learning.
4) School Infrastructure and Facilities
   While deep learning always emphasizes being integrated with technology, facilities, and infrastructure in schools are still not supportive, such as the availability of limited internet access, teaching aids, and learning media that are still not available.

To follow up on each of the challenges identified, all respondents consistently emphasized the urgent need for intensive, ongoing, and practical capacity-building programs. These include structured training, workshops, and seminars focused on the design and implementation of Deep Learning in real classroom settings. Teachers noted that previous exposure to Deep Learning was either minimal or overly theoretical, and that meaningful implementation would require hands-on guidance and continuous mentoring. Training should not only introduce the conceptual foundation of Deep Learning but must also model how to design learning experiences that are meaningful, joyful, and mindful in the context of geography where topics are often abstract, interdisciplinary, and place-based. Without such sustained professional development, teachers expressed concern that Deep Learning would remain a policy ideal with little classroom relevance.

In addition to training, teachers expect active institutional support, particularly from school principals, district supervisors, and policymakers. School leaders are expected to facilitate innovation by providing flexible scheduling for collaborative planning, investing in basic infrastructure (e.g., internet access, projectors, student devices), and cultivating a school culture that values pedagogical experimentation. The lack of these enabling conditions was frequently cited as a major constraint in attempts to transition from traditional teacher-cantered instruction to Deep Learning-based models. Teachers consistently voiced that the effectiveness of any

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educational reform including Deep Learning depends not only on their motivation and openness but also on structural readiness and institutional alignment (Fullan & Langworthy, 2014).

Despite their overall positive perceptions and enthusiastic attitudes, teachers acknowledged that they continue to face systemic barriers in four major areas: learning design, student characteristics, technological integration, and school infrastructure. First, they reported significant difficulty in adapting Deep Learning principles into lesson plans especially in geography, which requires contextualized, inquiry-driven, and spatial reasoning-based learning. Creating Deep Learning based instruction that is both critical and engaging, while also meeting curriculum demands, remains a significant cognitive and practical burden. Second, teachers noted that many students are still accustomed to passive, exam-oriented learning and lack the literacy, motivation, and independence needed for Deep Learning environments (Naidoo, 2021).

Third, technological integration emerged as both a pedagogical and logistical challenge. Teachers admitted limited competence in using digital tools, and even where willingness existed, access to appropriate technology was insufficient. Most schools lacked consistent internet connectivity, digital teaching materials, and classroom media, interactive whiteboards, or even adequate print resources (Khotimah & Abdan, 2025). These infrastructural issues further widen the implementation gap between curriculum aspirations and classroom realities. Fourth, Deep Learning's success hinges on a shift in mindset across all levels of the school system from leadership to learners which, according to many respondents, has not yet occurred in a coordinated and intentional manner.

Therefore, teachers strongly argued that systemic support is not optional it is fundamental. They called for professional learning ecosystems that are continuous, collaborative, and embedded in school practices. This includes revisiting the role of MGMP (Subject Teacher Forums) not merely as technical discussion groups but as communities of reflective practice where teachers co develop Deep Learning modules, share classroom experiences, and build collective confidence. Moreover, schools must move beyond compliance based reform and toward creating pedagogically enabling environments, where both innovation and failure are seen as part of professional growth.

Ultimately, without these structural and cultural shifts, the paradigm change promised by Deep Learning risks being reduced to surface level compliance rather than deep instructional transformation. The teachers' testimonies in this study reaffirm that educational reform must be grounded in classroom realities, where policy ideals are translated into feasible, supported, and context sensitive teaching practice.

4. CONCLUSIONS

This study concludes that geography teachers in West Java demonstrate generally positive perceptions and highly positive attitudes toward the implementation of Deep learning within the Merdeka Curriculum. Teachers acknowledged Deep Learning's pedagogical relevance to geography education, particularly its potential to enhance students' critical thinking, contextual analysis, and active engagement—key competencies for 21st-century learners. Despite their enthusiasm and willingness to adopt the deep learning approach, many teachers reported limited conceptual understanding and low confidence in translating deep learning principles into classroom practice, highlighting a clear gap between policy vision and instructional readiness.

Furthermore, several structural challenges persist, including difficulties in developing deep learning-based learning plans, students' limited readiness for student-cantered learning, inadequate technological integration, and poor infrastructure. These constraints inhibit the full realization of deep learning's transformative potential in schools. The findings also indicate that successful curriculum reform cannot rely solely on top-down mandates; rather, it requires

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systemic support in the form of ongoing professional development, institutional backing, and teacher collaboration platforms such as MGMPs.

Theoretically, this study contributes to the understanding of how subject-specific teacher agency mediates the implementation of pedagogical innovation. Practically, it offers evidence-based recommendations for aligning educational reform with teacher capacity and classroom realities. Future research should explore longitudinal outcomes of deep learning training, student responses to deep learning environments, and cross-subject comparisons to strengthen policy design and support meaningful, equitable transformation in education.

5. RECOMMENDATIONS

To support the practical application of Deep learning in geography classrooms, it is essential to implement targeted, continuous, and practice-oriented professional development for teachers. These trainings should not only introduce deep learning concepts theoretically but must also focus on how to design lesson plans, learning activities, and assessments that are aligned with deep learning principles such as meaningful, mindful, and joyful learning. Training programs must incorporate real classroom scenarios, provide sample modules, and allow teachers to simulate deep learning-based teaching strategies. Rather than being one-off events, such trainings should be part of a structured and ongoing development system integrated into the school's academic calendar.

Teacher collaboration forums such as MGMP should be revitalized as professional learning communities. These forums can serve as platforms for co-developing contextual deep learning teaching materials, reflecting on classroom challenges, and piloting instructional innovations. Peer mentoring systems can also be implemented within schools, pairing experienced teachers with less experienced ones to build confidence and foster a culture of sharing. To support these efforts, schools should provide dedicated time within the weekly schedule for lesson co-planning, collaborative evaluation, and curriculum adaptation.

At the school management level, principals should be involved not only as supervisors but as instructional leaders. They can encourage innovation by creating non-punitive spaces for experimentation, recognizing teacher efforts in implementing deep learning, and facilitating logistical support such as flexible scheduling or provision of basic resources. Infrastructure improvement does not always require large investments; initial steps such as ensuring functional Wi-Fi, projectors, and printed materials aligned with deep learning activities can significantly enhance teaching conditions. Furthermore, communication between policymakers and practitioners must be strengthened. Teachers should be involved in curriculum feedback loops, so that reforms are not only top-down but also shaped by classroom experience. Regional education offices can facilitate this by organizing listening sessions, needs assessments, and by translating policy documents into teacher-friended learning formats that provide concrete implementation guidance.

Future research should focus on evaluating the long-term impact of deep learning-based teaching on student learning outcomes, particularly in geography, where complex spatial and contextual thinking is emphasized. Longitudinal studies can provide deeper insight into how teacher perceptions, attitudes, and competencies evolve over time with consistent exposure to deep learning strategies. Additionally, comparative studies across subjects or school types (e.g., rural vs urban, public vs private) can offer a more comprehensive understanding of the varying challenges and successes in deep learning implementation. It is also important to explore student perspectives, to assess how deep learning affects their motivation, engagement, and critical thinking development. Such multidimensional research will contribute to building a more holistic and evidence-based foundation for educational transformation.

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