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How Do Physics Teachers Implement the Merdeka Curriculum in Learning Activities?

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ABSTRACT: The implementation of the Merdeka Curriculum in Indonesia since 2022 has encountered various challenges, particularly in physics learning. This study aims to identify and address these challenges by examining how physics teachers implement the Merdeka Curriculum. Using a qualitative case study approach, data were collected over four months from 14 physics teachers in five high schools in Jember Regency. The study employed interviews, observations, and documentation, analyzed through the Miles and Huberman model: data reduction, data presentation, and conclusion drawing. The findings reveal three key stages in the learning process: introduction, core, and closing. While teachers present objectives and problem orientation in the introductory phase, motivation and initial assessments are lacking. Core activities involve discussions and practicums but are mainly lecture-based, with minimal application of differentiated learning. The closing stage includes reflection, summary, and assignments. However, inconsistencies between observations and interviews indicate the suboptimal implementation of differentiated learning. To enhance curriculum effectiveness, teacher training in lesson planning and formative assessments is essential. This study's limitation is its small participant pool, suggesting future research should expand the sample size for broader validation.

Keywords: learning activities, merdeka curriculum, physics teacher.

ABSTRACT: *Implementasi Kurikulum Merdeka di Indonesia sejak tahun 2022 menghadapi berbagai tantangan, terutama dalam pembelajaran fisika. Penelitian ini bertujuan untuk mengidentifikasi dan mengatasi tantangan tersebut dengan meneliti bagaimana guru fisika menerapkan Kurikulum Merdeka. Dengan pendekatan studi kasus kualitatif, data dikumpulkan selama empat bulan dari 14 guru fisika di lima sekolah menengah atas di Kabupaten Jember. Penelitian ini menggunakan wawancara, observasi, dan dokumentasi yang dianalisis menggunakan model Miles dan Huberman: reduksi data, penyajian data, dan penarikan kesimpulan. Temuan menunjukkan tiga tahap utama dalam proses pembelajaran: pendahuluan, inti, dan penutup. Pada tahap pendahuluan, guru menyampaikan tujuan dan orientasi masalah, tetapi kurang memberikan motivasi dan asesmen awal. Aktivitas inti melibatkan diskusi dan praktikum, namun masih didominasi oleh metode ceramah dengan penerapan pembelajaran terdiferensiasi yang minimal. Tahap penutup mencakup refleksi, rangkuman, dan tugas. Namun, terdapat inkonsistensi antara hasil observasi dan wawancara yang menunjukkan bahwa penerapan pembelajaran terdiferensiasi belum optimal. Untuk meningkatkan efektivitas kurikulum, diperlukan pelatihan guru dalam perencanaan pembelajaran dan asesmen formatif. Keterbatasan penelitian ini terletak pada jumlah partisipan yang kecil, sehingga penelitian selanjutnya disarankan untuk memperluas sampel guna validasi temuan yang lebih luas.*

Kata kunci*: guru fisika, kegiatan pembelajaran, kurikulum merdeka.*

INTRODUCTION

The curriculum is main foundation underlying the education system by organising the teaching and learning process to achieve educational goals (Mulenga, 2018). The education system can maintain coherence with a curriculum, making it easier to direct and measure student progress. The role of the curriculum is not only to ensure students acquire basic knowledge and skills but also to provide guidelines for teachers to design and evaluate effective learning strategies (Coyle et al., 2014). Over time, the global curriculum has changed to adapt to the needs of the 21st century, including the integration of technology, skills-based approaches, and student-centred learning (Mitchell & Buntic, 2023). Current curriculum trends emphasise the importance of critical thinking, creative, communication and collaboration skills in meeting future challenges (Gouëdard et al., 2020).

The curriculum in Indonesia has undergone several changes to adjust to evolving demands. The most recent revision occurred in 2022 with the implementation of the Merdeka Curriculum, which was the eleventh major transformation of Indonesia's education framework. The Merdeka Curriculum remains competency-based, character- and creativity-based as an improvement from the previous curriculum and responds to global changes and the characteristics of the 21st century (Mulyasa, 2023). Unlike the previous curriculum, the Merdeka Curriculum offers learning based on actual issues, such as environmental and health issues, to support students' character development (Hunaepi et al., 2024). Furthermore, this curriculum provides opportunities for students to optimise their potential according to their interests and talents (Sari, 2023; Purnawanto, 2023). It also demands student independence in learning, encourages flexible approaches and student-centred learning and focuses on competencies and skills through project-based learning activities (Hunaepi et al., 2024).

Although the Merdeka curriculum promises various advantages, its implementation has many challenges. Curriculum implementation requires understanding and adjustment from all education stakeholders, including teachers (Lembong et al., 2023). Teachers' obstacles in implementing the new curriculum include adjusting learning strategies and developing relevant materials and assessment techniques aligned with curriculum objectives (Bümen et al., 2022). In reality, the level of teacher readiness varies due to the lack of teacher resources and training in implementing curriculum changes effectively. This is supported by Monalisa et al. (2023), which states that the main challenge in implementing the new curriculum is the ability of teachers to adapt to the demands of the new curriculum. Lack of in-depth understanding of Merdeka Curriculum principles can lead to suboptimal implementation in the classroom.

Teachers have a responsibility to convey material and create an attractive learning environment to support students' independence and critical thinking and produce competent graduates who uphold character values (Ruaya et al., 2022). In the Merdeka curriculum, the teacher acts as a facilitator and mentor in learning to encourage students to explore, ask questions and implement the knowledge

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gained from learning (Siswanto et al., 2024). In addition, according to Marmoah et al. (2023), teachers also play a role in designing a learning environment that is more dynamic, relevant and in accordance with the demands of the times. For this reason, teachers are not only required to master content. However, they must also be motivated to implement various reforms and understand pedagogical skill innovations to support student-centred learning activities (Sa'dullah, 2023).

The transition from the 2013 curriculum to the merdeka curriculum brings some difficulties for teachers. With the curriculum transition, teachers have to adjust to new standards and demands that cause teachers' responsibilities to increase, especially in resource management, ongoing research, and developing learning strategies (Granziera et al., 2016). This challenge has led to several views among teachers. Some view curriculum change as an opportunity to develop professionally. At the same time, there are also views regarding under-preparedness and the need for more confidence in adapting the learning process to align with the paradigm to meet new curriculum standards (Marmoah et al., 2023). Knowing teachers' perceptions can provide valuable insights to refine curriculum implementation strategies and realise curriculum success (Gulo, 2024).

Among various subjects taught at the secondary school level, physics learning has a unique role in encouraging scientific thinking, problem-solving, and critical thinking skills that are aligned with the competencies of the Merdeka Curriculum. Physics learning demands a more exploratory and inquiry-based approach, which emphasises conceptual understanding and practical application in real life (Bogador et al., 2024). Therefore, the ability of physics teachers to implement the Merdeka Curriculum is a key factor in the success of student-centred learning.

Various previous studies have discussed the implementation of Merdeka Curriculum, but there are still gaps in understanding the daily practice of the classroom. Gurion (2024) revealed that teachers have not fully implemented the Merdeka Curriculum completely and precisely because there is still confusion about what to do in the classroom. This research, however, does not provide a comprehensive picture of the specific parts of the learning activities that teachers have carried out; it is even possible that teachers have actually implemented the principles of the Merdeka Curriculum without realising it. Fakhrudin et al. (2023) also shows that teachers face various obstacles in implementing the Merdeka Curriculum, including readiness, obstacles, and challenges in preparing, implementing, and evaluating learning. However, this study also does not provide a detailed explanation of the obstacles faced by teachers in daily learning activities. Until now, there are still minimal studies that provide a detailed description of how teachers, especially physics teachers, carry out learning activities in the Merdeka Curriculum, including the challenges and opportunities that arise during the implementation process.

Based on this background, this study aims to describe the implementation of learning activities by physics teachers in the Merdeka Curriculum. This study is expected to provide insight into how teachers implement this curriculum and identify potential and challenges to improve the implementation strategy of the

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Merdeka curriculum. The findings of this study are also expected to contribute to the development of education policies that are more effective and relevant to the needs in the field.

RESEARCH METHOD

Participants

The research subjects were selected using a purposive sampling method. The technique is employed in qualitative research to identify issues pertinent to the subject matter under investigation (Bazen et al., 2021). Purposive sampling was chosen because it allows the selection of participants who have direct experience in implementing the Merdeka Curriculum so that they can provide in-depth insights into physics learning activity. The subjects of this study were 14 physics teachers, comprising seven males (50%) and seven females (50%), with an age range of 27–49 years, average tenure of 1–25 years, and teach in grades 10,11 or 12. They were currently employed as high school teachers. The participants were assigned alphanumeric identifiers to ensure confidentiality, with M denoting male and F denoting female. In addition, participants' data is kept anonymous and used only for research purposes, and access is restricted to ensure their privacy is maintained. The research subjects were drawn from five schools in the Jember district. These schools had implemented the Merdeka curriculum from 2022 onwards.

Research Design

The research design employs a case study approach, which entails a comprehensive and detailed examination of a single case. This approach is suitable for understanding the implementation of the Merdeka Curriculum because it allows in-depth exploration of teachers' experiences in implementing the curriculum in an authentic context. Case studies provide a detailed description of the learning activities carried out by teachers in physics learning so they can produce more comprehensive information. Furthermore, the utilisation of case studies is predicated on the fact that the queries posed in this research are of a 'how' and 'why' nature. Case studies are also based on researchers who do not require control over research events and situations (Alam, 2021). Hancock et al. (2021) suggests that using this case study will enable the researcher to conduct a more in-depth investigation and thorough examination of how teachers implement the merdeka curriculum in the learning activities at school.

Data Collection

The collection of data represents the most crucial phase of any research project. This study employed data collection techniques in three distinct stages: interviews, observation, and documentation. Semi-structured interviews are in-depth, allowing for greater flexibility compared to structured interviews (Ruslin et al., 2022). The utilisation of semi-structured interviews permits researchers to pose supplementary queries to the responses provided by informants. Observation is one of the techniques employed in data collection for research

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purposes, whereby subjects' behaviour in specific contexts is observed and recorded. Through observation, researchers can obtain precise data on research targets (Adler, 2022). In this study, observation entailed monitoring and recording the activities of the physics teacher in carrying out the learning activities. Documentation comprised data on lesson plan, teaching modules, photographs, and field notes that the researchers had taken during their observations. Researchers employed researchers to incorporate interview and observation data. Combining these three techniques complements each other and strengthens the validity of research findings. Interviews provide direct insights from teachers regarding their experiences in implementing the Merdeka Curriculum; observation allows researchers to directly observe the congruence between teacher statements and classroom practices, while documentation is concrete evidence that supports the results of interviews and observations. By applying data triangulation, this study can ensure that the findings are more credible and do not rely on only one source of information.

Data Analysis

The data analysis model employed is that proposed by Miles and Huberman. As outlined by Miles and Huberman (Salmona et al., 2024), the process of qualitative data analysis comprises three distinct stages. The initial stage is the reduction of the data. This involves the researcher summarising, selecting the main points, focusing on important elements, identifying themes and patterns, and preparing the raw data for analysis. The researchers reduced the interview data from all informants to select which data could be used and which aligned with the research objectives. The second stage is data presentation. The data is presented in narrative writing and described in verbal sentences so that conclusions can be drawn. At this juncture, the researchers arrange the data from the data reduction by the questions. The final stage, or the third stage, is drawing conclusions. This is a process of extracting the essence of the data presentation, which has been organised in sentences or formulas that are brief and succinct yet encompass a broad understanding. To ensure the credibility of the data analysis, this research applied data triangulation by comparing the results of interviews, observations, and documentation to validate the findings. This method makes the research results more trustworthy and reflects the actual conditions.

RESULT AND DISCUSSION

Result

Implementing the merdeka curriculum in learning activities is the teacher's responsibility. The teacher assumes the role of a facilitator, instilling character values in students. In this study, the physics teacher's steps regarding implementing the Merdeka Curriculum in learning activities were described from the interviews. The interview results were confirmed by observation and documentation using the triangulation technique. The results of data analysis demonstrate (Table 1) that the learning activity step comprises three essential stages: introductory activities, core activities, and finally, closing activities.

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Table 1. Physics learning activities in the merdeka curriculum

Learning Activity	Components
Introductory activity	a. Checking attendance b. Convey the learning objective c. Apperception d. Motivation e. Initial assessment f. Orientation to the problem g. Review of previous material
Core activity	a. Discussion b. Game c. Experiment d. Lecture e. Practice questions
Closing activity	a. Reflection b. Evaluation c. Conclusion d. Assignment e. Posttest

Introductory Activity

The observation results showed that most teachers (12 out of 14 teachers) implemented various important components in the introductory activities, such as checking attendance, delivering learning objectives, apperception, problem orientation, and reviewing previous material. Teachers try to carry out learning activities using the lesson plan that has been prepared. The delivery of learning objectives, an important component in guiding the direction of learning, can be done orally or in writing. Apperception is carried out to remind the material learned and the new material to be delivered. In the Merdeka curriculum, problem orientation is important, where the problems raised are contextual and relevant to everyday life. The following section presents some teachers' opinions on the physics learning activities in the introduction stage.

> "I do the introduction with greetings, ask about the presence of students, the condition of the students and slightly remind the learning that has been learned in the previous meeting so that students are ready to take part in the learning that is carried out" (*interview_ ED_F*)

> "...preliminary activities are usually carried out by checking the presence of students, conveying learning objectives, asking questions related to learning material..." (*interview_HB_M*)

> "....delivering learning objectives, providing motivation, instruction and apperception..." (*interview_CP_F*)

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> "...greetings, checking students' attendance, checking students' learning readiness, checking the assignments given at the previous meeting, both homework and project assignments, reminding a little asking students about the material learned at the previous meeting, and linking the material to be learned with everyday life" (*interview_SJ_M*).

However, other important components, such as motivation and initial assessment, are still minimally done by most teachers (only 2 out of 14 teachers). Time constraints are often the reason, as teachers usually only allocate 10 minutes for preliminary activities. As a result, motivation and initial assessment are often skipped, and learning moves directly to the core activities.

Core Activity

The interview results regarding the learning activity in the core activities show that the steps of student activities have been adjusted to the syntax or stages of the learning model. Applying various methods can encourage students to be more active in learning. The methods, learning resources, and learning media chosen are also based on the characteristics of the material so that learning objectives can be achieved. In the core activities, the teacher is a facilitator who connects interactions between students, students and teachers, and students with learning media. The following are illustrative results of interviews with teachers.

> "...the core activities follow the syntax of the model used; the learning model used is Problem-Based Learning (PBL)..." (*interview_DR_F*)

> "The learning method is chosen based on the competencies to be achieved. If the material taught is more theoretical, then I do lectures. If it requires hands-on activities, then I will use the practicum method. I use learning resources from textbooks. Learning media, such as whiteboards and PPT, because they subscribe to Quipper, sometimes the learning media uses Quipper" (*interview_MA_M*).

Furthermore, teachers involve students as much as possible to encourage them to actively participate in learning. Teachers provide opportunities by including them in the learning activities through joint discussions, presentations in front of the class, and so on, as described by the following respondents.

> "In the core activities, I give LKPD (Student's worksheet) to discuss with their group members. Then, I ask some groups to communicate the results of their discussions in front of other friends, allowing students to ask questions/rebuttals. After finishing, I appreciated the group members who performed and straightened out the concepts that were not quite right" (*interview_EF_F*).

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Unfortunately, the findings from direct observation in the classroom, at the core activity stage, show a difference from the interview results. Based on the observation, teachers still dominate the learning activity. Most teachers, especially in classes 11 and 12, are still the center of learning activities in core activities. The lecture method is the most commonly used, although other methods, such as discussion, practicum, and question practice, are also sometimes implemented. Discussion and practicum methods can encourage students to be more active in learning. However, the implementation faces several obstacles. In the discussion method, the main obstacle is the unavailability of structured LKPD. Usually, teachers only give topics to discuss without clear directions. Most available LKPDs only contain simple practice questions that cannot train higher-order thinking skills. Meanwhile, the obstacles faced in the practicum method include limited equipment in some schools and the need for teacher skills in virtual laboratories. Furthermore, the learning media used still needs to be more optimal in providing an interactive experience. Learners generally use laptops and mobile phones to complete assignments or search for additional materials. Moreover, the core activities still need to implement differentiated learning, which is the learning that is expected in the classroom.

Closing Activity

The closing activity is the final stage of the learning activity, generally carried out by reflecting on the learning activities on that day. In addition to reflecting, in the closing activity, the teacher guides students in concluding the material that has been learned. All research subjects stated the same thing, by the following interview results.

> "...closing activities begin with reflection, joint conclusions, preparing for the next meeting..." (*interview_KH_M*)

> "...there is a conclusion of what we have learnt, and there is a reflection such as asking how the lesson the lesson can be understood or if the learning is fun" (*interview_IP_F*)

According to another opinion, the end of the learning activity includes drawing conclusions and giving assignments to students.

> "...conclusion of the material that has been explained, giving homework, and informing the material for the next meeting" (*interview_ED_F*).

Furthermore, reinforcement needs to be given at the closing activity stage, as shown in the following interview results.

> "...the point is to reinforce students for the material learned; if time is tight, the teacher concludes. If there is much time, the students will conclude, and then the teacher will summarise the students' conclusions" (*interview_UF_W*)

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The task given by the teacher is a follow-up to learning, which is related to the material that has been learned and the material to be learned. Based on the observations in closing activities, it is in line with the results of the interviews. The subject teacher gives reflection to students in the form of questions about the material that has been learned. Furthermore, the teacher and students read out the conclusion of the learning activity. In addition, at this stage, the teacher also explains the material to be learned at the next meeting and gives homework to students. If time permits, the teacher usually also conducts a posttest.

Discussion

Learning activities in the Merdeka Curriculum provide flexibility and make it easier for teachers to implement more in-depth learning. The Learning activity emphasises the most needed content to develop student competence and character. This is an effort to answer various challenges of the times and current issues, such as climate change, digital literacy, science literacy and others (Amrullah et al., 2024). Martatiyana's research (2023) states that learning in the Merdeka curriculum is more flexible; learning can be adjusted to the needs of developing student competencies, the characteristics of the education unit, and the context of the local socio-cultural environment. Furthermore, teachers are expected to carry out varied learning activities (differentiated learning) according to students' level of understanding or competence. Teachers are expected to organise learning that provides quality learning experiences at this stage. Also, during the learning activity, teachers can conduct formative assessments to determine the extent to which students have achieved learning objectives. For example, in physics, teachers can implement a project-based learning model by presenting problems around students, such as using fossil fuels. This problem can be related to renewable energy material in class X. Through these problems; students are asked to design solutions to reduce the use of fossil fuels, for example, by making projects such as miniature solar power plants. In addition, in reporting project assignments, students are not limited to making reports in papers. Reports can be prepared according to group agreements and tailored to student interests, such as posters, videos, etc. This approach aligns with the Merdeka Curriculum's principles, which emphasises more flexible learning and adapts to students' talents, interests, and characteristics.

The results showed that learning activities by physics teachers can be categorised into three main stages: introduction, core, and closing. The findings describe the steps teachers take at each stage, such as conveying learning objectives, conducting discussions, practicum, and evaluating learning. In addition, this research provides valuable insights into how teachers try to implement Merdeka Curriculum principles, such as student-centred learning. Interviews with teachers show their efforts to encourage active student involvement, although classroom observations indicate that implementation has not been fully optimised. This finding is an important contribution to understanding the real challenges faced by physics teachers and providing an

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overview of further training needs to improve the implementation of the Merdeka Curriculum (Fakhrudin et al., 2023).

The first stage in physics learning activities is the introduction stage, where the teacher carries out activities in accordance with the lesson plan that has been prepared. The important components in this stage were also carried out well, such as conveying learning objectives and providing triggering questions in the form of problems in everyday life. However, some important aspects are still minimally carried out by teachers, namely providing motivation and formative assessment at the beginning of learning activities. Whereas, formative assessment at the beginning of learning activities can be done by using short digital app-based quizzes to measure their initial understanding. Motivation and formative assessment at the beginning of learning are essential to build students' learning readiness and tailor learning strategies to their needs. Early assessment can provide valuable information about students' level of understanding before learning begins so that teachers can implement learning according to students' needs (Aslihah et al., 2023). Formative assessment activities at the beginning of learning can be done orally or in writing. The assessment results are used as a basis for a teacher to create a learning strategy to suit the learning needs of students (Sasomo & Rahmawati, 2023). Furthermore, with the results of this initial assessment, teachers can implement differentiated learning in core activities, as expected in the Merdeka curriculum (Mujiburrahman et al., 2023). The factors causing the lack of implementation of initial assessments are teachers' lack of understanding and limited time. This is in accordance with the results of Anggraini et al. (2023), which states that teachers do not understand how diagnostic tests in the independent curriculum should be carried out at the beginning of each material. However, due to a lack of time to analyse the assessment results, teachers only do it once.

In the core stage, there are differences in the results of interviews and observations. The results revealed a gap between teachers' claims regarding student-centred learning approaches and the reality in the field. In interviews, most teachers claimed to have used learning methods that involve students actively, such as group discussions and practicum. However, direct observation shows that most of the learning is still dominated by the lecture method, especially in classes XI and XII. However, with only one method dominating learning activities, learning can be less interactive, inspiring, fun, and meaningful. This is in line with Syaodih & Wulansari (2019), which states that using a variety of methods can overcome student boredom and improve student concept understanding. Furthermore, Nurfitriyanti (2016) said that learning methods that only allow students to listen, record, and memorise cannot make the learning process interactive. This gap can be caused by several factors, such as the lack of in-depth training on implementing the Merdeka Curriculum and the limited practical guidance teachers can use. In addition, limited time and resources to design diverse learning are also an obstacle. This is in line with previous research findings, which show that teachers' lack of understanding and readiness, limited references, uneven access, and time management are often the main obstacles in

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implementing the new curriculum (Nasution, 2023). Other external factors that also play a role are the limitations of practicum tools, making it difficult for teachers to provide direct experience to students. To overcome this, using technology such as interactive simulations or experimental videos can be an alternative so that students can still understand concepts more actively. In addition, to improve the quality of learning, differentiated learning strategies need to be implemented (Mastuti et al., 2022). Differentiation can be done by designing LKPDs that are more varied and challenging and utilising technology to create a more interactive learning experience (Suyatna, 2024). Teachers also need to be trained to understand and apply learning strategies that are appropriate to the level of student readiness (Handiyani & Muhtar, 2022).

In the closing activities, all activities went well and were in accordance with the lesson plans made. The results of interviews and observations were not significantly different. Everything said by the participants was in accordance with what was done in the classroom. Important components in closing activities, such as concluding and reflection as part of formative assessment, are well implemented. A formative assessment carried out at the end of learning activities is used as a basis for reflecting on the entire learning process, which can be used as a reference for learning planning and revisions if necessary (Mujiburrahman et al., 2023). This shows that teachers have consistency in the implementation of closing activities, which not only help students understand the material that has been learned but also become a means to evaluate the effectiveness of the learning methods used. Thus, the closing stage links the learning that has been carried out and future learning planning.

The findings of this study support previous literature that emphasises the importance of flexibility and differentiation in the Merdeka Curriculum. For example, Arantini et al. (2024) shows that implementing flexible learning can increase student engagement. However, according to Kamaruddin et al. (2022) also revealed that such flexibility is difficult to realise without adequate resource support. There are many challenges in implementing differentiated learning, such as the need for good planning. Some teachers think that doing differentiated learning is not a simple thing to do. This aligns with Zikri & Novio (2024). Some teachers experience challenges due to limited time to design differentiated learning based on individual student needs. Others have difficulty grouping students based on readiness due to the large number of learners and limited classroom space. In addition, this finding adds new insights by identifying specific barriers teachers face in implementing the Merdeka Curriculum, such as the lack of availability of practicum tools and limited understanding of formative assessment. This reinforces the need for training focused on practical implementation and providing supportive resources.

Based on these findings, practical steps that can be taken to improve the implementation of the Merdeka Curriculum include training for teachers, especially in designing student-centred learning and implementing formative assessment. This training also needs to include making LKPDs that encourage student involvement and develop critical thinking, creativity, communication, and

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collaboration skills. In addition, education policy needs to support providing adequate resources, such as lab equipment and technology platforms for learning. Local governments and schools can also work together to provide additional time for teachers to design better learning according to Merdeka Curriculum principles.

This study has limitations. The relatively small number of participants, which only includes high school physics teachers in the Jember Regency. Therefore, the findings cannot be widely generalized. For future research, it is recommended that more participants from various regions be involved to identify more diverse patterns in implementing the Merdeka Curriculum. This research can also be developed by applying different methods and involving more participants to determine the level of understanding of the implementation of the Merdeka Curriculum, which can later become the basis for evaluating the Indonesian Education Curriculum.

CONCLUSION

Based on the results of research on how physics teachers implement learning activities under the Merdeka Curriculum, it is found that there are three stages of learning, namely: introduction, core, and closing activities. The findings show that although the introduction and closing activities generally follow the lesson plan, the core activities face significant challenges. Teachers often dominate the core learning process, with the application of differentiated learning not being optimal, even though this learning is expected to be implemented in the Merdeka Curriculum. Challenges that arise include insufficient teacher readiness, insufficient understanding of formative assessment, limited resources, and time constraints to design varied learning experiences. One of the actual impacts of this challenge is the difficulty teachers have in compiling Learner Worksheets (LKPD) that are suitable for a variety of student diversity, so learning strategies are difficult to adapt to individual needs. As a result, student engagement in the learning process is lacking, and the achievement of competencies expected in the Merdeka Curriculum is not optimal. To overcome this challenge, intensive training is needed for teachers in designing learning activities and preparing formative assessment instruments. In addition, time management strategies in designing differentiated learning need to be developed so that teachers can more easily manage the preparation and implement it in the classroom. This study has limitations regarding the number of participants, which only includes physics teachers in the Jember Regency, so the results cannot be widely generalised. Therefore, further research with a larger scope, covering various subjects and regions, is recommended to validate the findings and explore innovative solutions in implementing the Merdeka Curriculum.

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