



## The Implementation of the Independent Curriculum in Grade X Physics Learning at Senior High Schools

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**Abstract:** This study aims to analyze the planning, implementation process, and assessment of the Independent Curriculum implementation in physics learning for Grade X students at public senior high schools (SMA Negeri) in Polewali Mandar Regency. This research employs a quantitative descriptive analysis method. The independent variable in this study is the implementation of the Independent Curriculum, while the dependent variable is physics learning. Data were collected through questionnaires distributed to 1,022 Grade X students in Polewali Mandar Regency, who served as the research subjects, as well as through interviews and direct observations with 10 Grade X physics teachers in the region, who also served as research subjects. The validity of the questionnaire instruments, interview guidelines, and observation guidelines was ensured through expert validation. The analysis results indicate that: overall, the planning of the Independent Curriculum implementation in physics learning has been carried out effectively; overall, the implementation of the Independent Curriculum in physics learning has been carried out effectively; and overall, the assessment implementation of the Independent Curriculum in physics learning has also been carried out effectively.

**Keywords:** Implementation; Independent curriculum; Physics learning.

### Introduction

The curriculum is essentially a plan that serves as a guideline for conducting the educational process. It functions not only as an administrative framework but also as a systematic organization of knowledge and a manifestation of students' learning experiences (Ingram, 1979). When the curriculum is fully supported by all elements of education, the learning process will run smoothly and produce competent learners (Mashile et al., 2023). In a global context, the curriculum is expected to equip students to face the challenges of the times with a strong scientific foundation (Kemdikbudristek, 2022).

In Indonesia, the curriculum has continually undergone dynamic changes and improvements. According to Dhanapala (2021); Mahardhani et al. (2023); Zaini (2024), a curriculum that clearly defines its objectives, is relevant, and responsive to changes in the

educational landscape and societal needs is essential to ensure that education provides maximum benefits for future generations. Moreover, the curriculum also reflects the philosophical values upheld by its designers (Purba et al., 2024).

Since Indonesia's independence in 1945, its national curriculum has undergone numerous changes, including: the 1947 Teaching Plan, the 1952 Detailed Teaching Plan, the 1964 Education Plan, the 1968 Elementary School Curriculum, the 1975 Development School Pioneer Project, the 1984 Curriculum, the revised 1994 Curriculum, the 2004 Competency-Based Curriculum, the 2006 School-Based Curriculum, the 2013 Curriculum and its revisions, and most recently, the *Merdeka Curriculum* introduced in 2020 (Putri & Maula, 2024). These changes have been made in an effort to address the shortcomings of previous curricula and to strengthen aspects that align with the evolving needs of the times.

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The *Merdeka Curriculum* emerges with a renewed spirit that prioritizes character development based on the values of *Pancasila*, while integrating literacy skills, knowledge, attitudes, and technological proficiency (Al-Fajri & Andarwulan, 2023). This curriculum is designed to foster students with strong and ethical character (Brummelen & Lin, 2022), and it calls for an inclusive, contextual, and participatory approach that aligns with the culture of each educational institution (Ajani, 2024).

Minister of Education Nadiem Makarim stated that *Merdeka Belajar* represents a form of freedom in thinking (Yamin & Syahrir, 2020). Before becoming the official national curriculum, the *Merdeka Curriculum* was initially implemented on a limited scale through the *Sekolah Penggerak* (Driving School) program. Subsequently, the Ministry of Education, Culture, Research, and Technology issued BSKAP Head Decree No. 034/H/KR/2022, which regulates three categories of implementing schools: *IKM Mandiri Belajar* (Independent Learning), *IKM Mandiri Berubah* (Independent Transformation), and *IKM Mandiri Berbagi* (Independent Sharing) (Kemendikbudristek, 2023).

The *Merdeka Belajar* program promotes a joyful learning environment that empowers both students and teachers (Sekretariat GTK, 2020). Research by Baro'ah (2020); Drake & Sherin (2006) emphasizes that learning systems should be designed to build students' character rather than focusing on ranking systems, which are often a source of anxiety. This curriculum also applies the principles of *teaching at the right level* and *implementation at the right level* (Kemendikbudristek, 2024), and adopts a *student-centered learning* approach, similar to those used in European countries (Qizi, 2024). Nevertheless, the implementation of this curriculum faces several challenges, particularly in the design of teaching materials and the lack of optimal support for teachers (Nurfadila et al., 2023).

The implementation of the *Merdeka Curriculum* in educational institutions is based on three main aspects: Lesson planning, which, according to Botes & Barnett (2022), should foster students' critical awareness of social issues and encourage educational collaboration. Well-structured planning is a key determinant of successful learning processes (Noor, 2022). Lesson implementation, which is viewed as the translation of ideas, policies, or innovations into concrete actions aimed at creating meaningful learning environments (Armita et al., 2023; Özdemir, 2019; Pela et al., 2023). Learning assessment, which is a process of comprehensively evaluating students' achievements. Assessment in the *Merdeka Curriculum* includes formative and summative evaluations, as well as assessments of *Projek Penguatan Profil Pelajar Pancasila* (P5) or the *Pancasila Student Profile Strengthening*

Project (Gao et al., 2024; Mishra, 2024; Schildkamp et al., 2020).

However, the implementation of the *Merdeka Curriculum* in the field faces various obstacles. Based on preliminary observations conducted by the researcher at public senior high schools (*SMA Negeri*) across Polewali Mandar Regency, one of the main challenges identified is the increasing administrative workload of teachers. Teachers are not only responsible for teaching and developing the P5 program (*Projek Penguatan Profil Pelajar Pancasila*), but are also required to complete various documents such as lesson plans (*RPP*) and evaluation reports. This situation reduces their focus on the quality of classroom instruction.

In addition, the absence of a student retention policy poses another significant challenge. All students are promoted to the next grade automatically, even if some have not yet achieved basic competencies such as reading and arithmetic. This creates difficulties for teachers, especially in complex subjects like physics. According to Amsal et al. (2020); Hanum (2021); Ismayanti et al. (2024); Trianto (2010), physics education involves comprehensive planning, implementation, and assessment processes, although it is often overly focused on cognitive aspects (Sudarmini et al., 2015). Teachers must adapt their instructional methods through the development of learning modules (Aris et al., 2024), and cultivate scientific process skills as well as 21st-century competencies such as collaboration, creativity, and problem-solving (Syahrial, 2024), to ensure that all students are able to engage effectively with the material.

Furthermore, there has been a reduction in the allocated time for physics instruction, from three hours to two hours per week. Research by Syakila & Hidayati (2024) indicates that this time constraint makes it difficult for students to fully grasp the abstract and complex concepts inherent in physics.

Based on the background described above, the researcher has chosen the title of the study: "The Implementation of the *Merdeka Curriculum* in Physics Learning for Grade X at Senior High Schools."

## Method

This study is a quantitative descriptive research. It aims to describe a phenomenon, event, or occurrence factually, systematically, and accurately.

The subjects of this study are all public senior high schools (*SMA Negeri*) in Polewali Mandar Regency, West Sulawesi Province. There is a total of 13 public senior high schools across 9 districts. This study focuses on one district—Polewali District—which has the highest number of public senior high schools, totaling 4 schools.

<b>Table 1. Public Senior High Schools (SMA Negeri) in Polewali Mandar Regency, West Sulawesi Province</b>	
School Name	Merdeka Curriculum
SMAN 1 Polewali	<i>Mandiri Berbagi</i>
SMAN 2 Polewali	<i>Mandiri Berbagi</i>
SMAN 3 Polewali	<i>Mandiri Berbagi</i>
SMAN 4 Polewali	<i>Mandiri Belajar</i>

(Kemendikbudristek, 2022)

The data collection techniques used in this study included questionnaires, observation sheets, and interview guidelines. The questionnaire was distributed to 1,022 students from the four selected schools. Observations were conducted with 10 teachers, focusing on the review of administrative completeness, teaching materials, as well as the implementation and assessment processes in physics instruction. In addition, interviews were conducted with physics teachers to clarify the results of the observations and student questionnaire responses regarding the implementation of the *Merdeka Curriculum* in physics learning.

Before using the instruments, a validity test was first conducted by a team of expert validators. The validation results for the *Merdeka Mandiri Belajar* curriculum questionnaire instrument, which initially consisted of 53 statements, led to the selection of 40 statements representing each indicator. The observation guideline instrument, consisting of 72 statements, was reduced to 40 representative statements. The interview guideline instrument, originally containing 66 questions, was refined to 22 questions representing each indicator.

Meanwhile, the validation results for the *Merdeka Mandiri Berbagi* curriculum questionnaire instrument, which consisted of 70 statements, resulted in the selection of 46 statements representing each indicator. The observation guideline instrument, originally composed of 108 statements, was refined to 57 representative statements. The interview guideline instrument, which initially contained 108 questions, was narrowed down to 36 questions representing each indicator.

The data will be processed descriptively in the form of percentages. The methods for calculating the percentage for each item, each indicator, and each dimension are as follows.

#### Item Analysis

This analysis aims to identify the most prominent alternative among the available options for each item. It is expressed using the following formula (Sudjana, 2013):

$$\text{Analysis item} = \frac{N}{P} \times 100\% \quad (1)$$

#### Note:

*n* = number of identical choices for a single item  
*P* = total number of respondents

#### Indicator Analysis

This analysis aims to determine the overall implementation of the Merdeka Curriculum by each teacher for each specified indicator. It is expressed using the following formula (Sudjana, 2013):

$$\text{Analysis indicator} = \frac{N_m}{N \times P} \times 100\% \quad (2)$$

#### Note:

*Nm* = number of identical choices from items under a single indicator

*N* = number of items under one indicator

*P* = total number of respondents

#### Dimension Analysis

This analysis aims to determine the overall implementation of the Merdeka Curriculum by teachers for each predetermined problem dimension. It is expressed using the following formula (Sudjana, 2013):

$$\text{Dimensional analysis} = \frac{N_n}{N \times P} \times 100\% \quad (3)$$

#### Note:

*Nn* = number of identical choices from items within a single problem dimension

*N* = number of items within that problem dimension

*P* = total number of respondents

## Result and Discussion

The Merdeka Curriculum is divided into three types: *Merdeka Mandiri Belajar* Curriculum, *Merdeka Mandiri Berubah* Curriculum, and *Merdeka Mandiri Berbagi* Curriculum. This study focuses only on the *Merdeka Mandiri Belajar* Curriculum and the *Merdeka Mandiri Berbagi* Curriculum. The schools implementing these are SMA Negeri 4 Polewali (*Merdeka Mandiri Belajar* Curriculum), and SMA Negeri 1 Polewali, SMA Negeri 2 Polewali, and SMA Negeri 3 Polewali (*Merdeka Mandiri Berbagi* Curriculum). This research focuses on the Polewali District, Polewali Mandar Regency, and only two types of curriculum are implemented there.

#### *Merdeka Mandiri Berbagi Curriculum*

#### *Results of Analysis for the Merdeka Mandiri Berbagi Curriculum Planning*

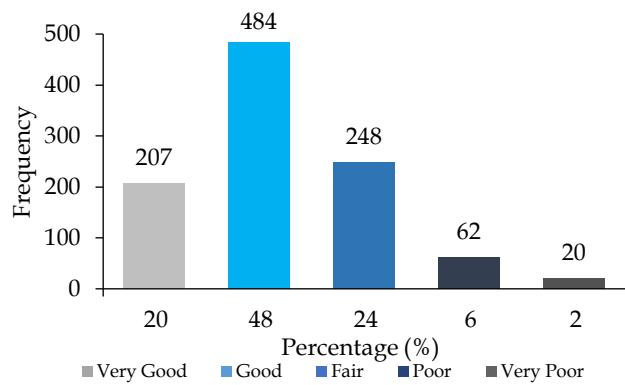
The measurement of lesson planning was conducted using a questionnaire instrument consisting of 12 statement items with 5 alternative responses. Respondents were required to choose one of the alternatives as their answer. Thus, the minimum

possible score was 5, and the maximum possible score was 60. Based on these theoretical scores, the frequency distribution for each category can be seen in the following table.

**Table 2.** Percentage of physics teachers' lesson planning levels

Category	Interval	Midpoint	Frequency	Percentage (%)
Very Good	52-60	57	207	20
Good	42-51	47	484	48
Fair	32-41	37	248	24
Poor	22-31	27	62	6
Very Poor	12-21	17	20	2

Based on the frequency distribution in Table 2 above, it can be seen that the planning dimension of learning, with an average score of 44.79, falls into the good category.



**Figure 1.** Histogram of physics learning planning in the *Merdeka Berbagi* implementation of the *Merdeka Curriculum*

Learning planning is designed in the form of CP (Learning Outcomes), TP (Learning Objectives), and ATP (Learning Objectives Flow), which are directly issued by the Ministry of Education, Culture, Research, and Technology and oriented toward strengthening Pancasila character and competence (Kemendikbudristek, 2024). In the Independent Sharing model, educational units are allowed to modify the TP used. The module developed by the teachers is a collaborative product created by several teachers.

All educational units involved in this research, which implemented the Independent Sharing Merdeka Curriculum, engaged in collaboration with all physics teachers at their respective institutions. This collaboration was not limited to grade X teachers but also included physics teachers from grades XI and XII. Based on interview results, this collaboration was carried out to facilitate the development of teaching modules and to optimize the module content by aligning

it with Pancasila values and the specific conditions of each educational institution.

Based on the results of the research and data analysis, it was found that the learning planning dimension showed the following distribution: 21% of physics lesson planning was implemented very well, 47% was implemented well, 24% was implemented fairly well, 6% was implemented poorly, and 2% was not implemented well. These findings indicate that physics teachers at public senior high schools implementing the Independent Sharing Merdeka Curriculum fall into the good category.

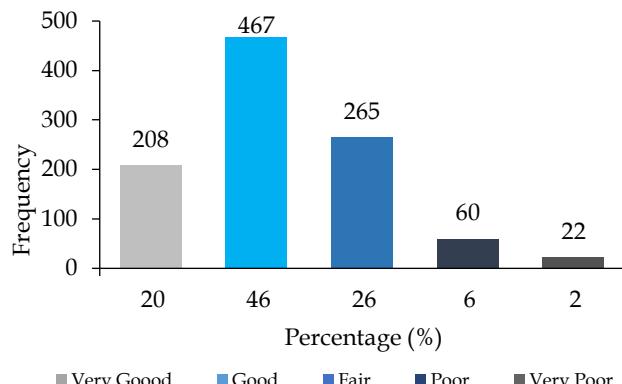
#### *Results of Analysis for the Merdeka Mandiri Berbagi Curriculum Execution*

The measurement of teaching implementation was conducted using a questionnaire instrument consisting of 27 statement items with 5 answer choices, from which respondents were required to select one. Therefore, the lowest possible score is 5 and the highest possible score is 135. Based on this theoretical score range, the frequency distribution for each category can be seen in the following table.

**Table 3.** Percentage of physics teachers' lesson execution levels

Category	Interval	Midpoint	Frequency	Percentage (%)
Very Good	115-135	125	208	20
Good	92-114	103	467	46
Fair	69-91	80	265	26
Poor	46-68	57	60	6
Very Poor	23-45	34	22	2

Based on the frequency distribution in Table 3 above, it can be concluded that the dimension of teaching implementation, with an average score of 97.32, falls into the good category.



**Figure 2.** Histogram of Physics Learning Execution in Implementation of the *Merdeka Berbagi Curriculum*

In physics learning, implementation often does not align with the initial planning—especially under the current curriculum, which has reduced the allocated time for physics instruction. This reduction significantly impacts the execution of learning activities. According to Tain et al. (2023), the implementation of physics learning requires additional time so that students can be guided intensively and engage actively. However, in several instances, the researcher observed that a teacher at one school implementing the *Merdeka Curriculum – Independent Sharing (IKM Mandiri Berbagi)* did not follow the content of the provided module. There were also cases where the implementation failed to meet critical aspects required for the successful application of the *Merdeka Curriculum – Independent Sharing* model.

Based on classroom observations during physics lessons, several indicators of the Merdeka Curriculum were not fulfilled. Follow-up interviews with teachers at each school unit revealed that the content of the modules often did not align with actual classroom activities. This discrepancy was mainly due to the results of formative assessments, which showed that many students needed different learning methods or styles than those originally planned. However, the learning modules were not entirely unsuitable—misalignment occurred only in a few sessions.

Based on the research findings and data analysis, the implementation of physics instruction showed the following percentages: 20% indicated very good implementation, 46% good implementation, 26% fairly good implementation, 6% poor implementation, and 2% very poor implementation. These findings indicate that physics teachers at SMA Negeri 1 Polewali, SMA Negeri 2 Polewali, and SMA Negeri 3 Polewali have implemented physics instruction well. Therefore, the researcher concludes that in terms of instructional implementation, physics teachers in public senior high schools applying the *Merdeka Mandiri Berbagi* Curriculum fall into the good category.

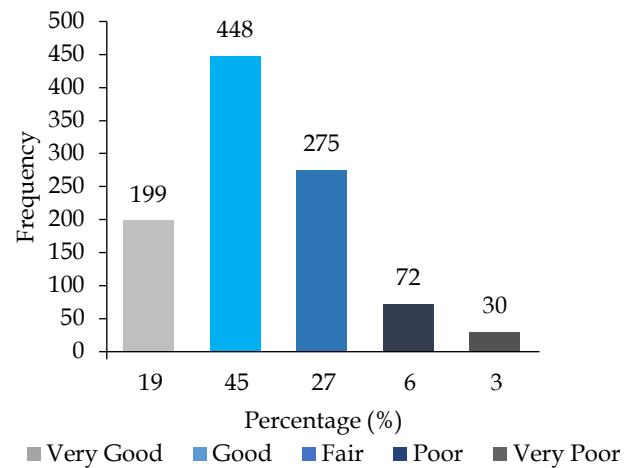
#### Results of Analysis for the *Merdeka Mandiri Berbagi Curriculum* Assessment

The measurement of learning assessment was conducted using a questionnaire instrument consisting of 7 statement items with 5 alternative answers, and respondents were required to choose one of them as their response. Accordingly, the minimum possible score was 5, and the maximum possible score was 35. Based on these scores, the frequency distribution for each category can be seen in the following table.

**Table 4.** Percentage of physics teachers' lesson assessment levels

Category	Range	Midpoint	Frequency	Percentage (%)
Very Good	29-35	32	199	19
Good	23-28	26	448	45
Fair	17-22	20	275	27
Poor	11-16	14	72	6
Very Poor	5-10	8	30	3

Based on the frequency distribution in Table 4 above, it indicates that the learning assessment dimension, with an average score of 24.23, falls into the good category.



**Figure 3.** Histogram of physics learning assessment in implementation of the *Merdeka Berbagi* curriculum

In the Merdeka Curriculum, there are two types of assessment: summative and formative. Assessment is also evaluated through the Projek Penguatan Profil Pelajar Pancasila (P5), which serves as an indicator of the curriculum's implementation within a school unit. The P5 projects conducted by the schools involved collaboration with students' parents, local communities, industries, and organizations around the school environment.

However, based on observations and interviews with teachers, not all P5 implementations involved collaboration with parents. In many cases, the final products of the P5 projects were found to be damaged, as observed directly in the field across all school units. Nevertheless, each school successfully implemented P5 with different themes.

At SMAN 3 Polewali, the chosen P5 project was the development of a solar-powered stove as a form of technological innovation, which was successfully implemented. At SMAN 1 Polewali, the project involved producing compost from organic waste around the school, and the school had reached the stage of harvesting the product. Finally, SMAN 2 Polewali

created a mini fan utilizing recycled materials as their technological innovation.

Based on the research findings and data analysis, the dimension of learning assessment showed the following results: 19% indicated that the assessment was implemented very well, 45% indicated good implementation, 27% indicated fair implementation, 6% indicated poor implementation, and 3% indicated very poor implementation. These findings suggest that physics teachers applying the *Merdeka Mandiri Berbagi Curriculum* in Polewali Mandar Regency have carried out physics learning assessments effectively.

#### *Merdeka Mandiri Belajar Curriculum*

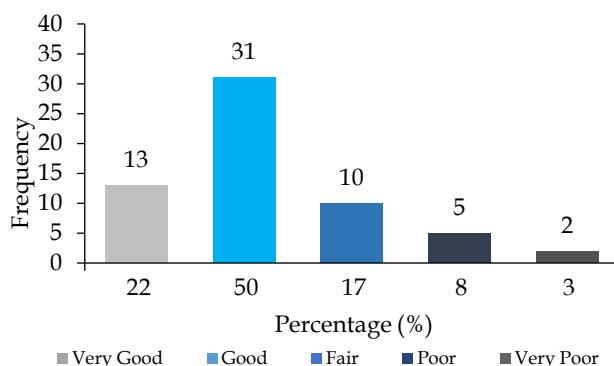
#### *Results of Analysis for the Merdeka Mandiri Belajar Curriculum Planning*

The measurement of learning planning was conducted using a questionnaire instrument consisting of 12 statement items with 5 answer alternatives, and respondents were required to choose one of them as their answer. Thus, the minimum possible score was 5, and the maximum possible score was 60. Based on this theoretical score range, the frequency distribution for each category can be seen in the following table.

**Table 5.** Percentage of physics teachers' lesson execution levels

Category	Interval	Midpoint	Frequency	Percentage (%)
Very Good	52-60	57	13	22
Good	42-51	47	31	50
Fair	32-41	37	10	17
Poor	22-31	27	5	8
Very Poor	12-21	17	2	3

Based on the frequency distribution in Table 5 above, it indicates that the learning planning dimension, with a mean score of 44.65, falls into the good category.



**Figure 4.** Histogram of physics learning planning in implementation of the *Merdeka Belajar* curriculum

Learning planning is designed in the form of CP (Learning Outcomes), TP (Learning Objectives), and ATP (Learning Objectives Pathway), which are directly issued by the Ministry of Education, Culture, Research, and Technology and are oriented toward strengthening character and competence. In the Independent Learning model, educational institutions still use the 2013 Curriculum, but they may begin to implement certain components or principles of the Merdeka Curriculum in a limited and flexible manner. Learning planning consists of Learning Outcomes (CP), which are directly issued by the Ministry of Education, Culture, Research, and Technology (Kemendikbudristek). Teachers then independently create Learning Objectives (TP) and Learning Objective Pathways (ATP) as guidelines for the teaching process. However, in the Independent Learning type of the Merdeka Curriculum, teachers still refer to the TP and ATP developed directly by Kemendikbudristek. Based on these three components, a teaching module is produced, which includes instructional materials, teaching steps, and student worksheets (LKPD) used by the teacher.

During the interview stage, one of the teachers stated that although the Independent Learning type of the Merdeka Curriculum is still tied to the 2013 Curriculum, it also follows the current Merdeka system, which has proven to present significant challenges. The transition process between curricula requires teachers to continuously innovate in preparing teaching materials that must be adapted to the school environment. In addition, another obstacle faced by teachers in planning lessons is the limited availability of textbooks provided by the school.

Based on the research findings and data analysis, it was found that the dimension of lesson planning showed the following distribution: 22% indicated that the planning of physics lessons was implemented very well, 50% indicated it was implemented well, 17% indicated it was implemented fairly well, 8% indicated it was poorly implemented, and 3% indicated it was not implemented well. Therefore, the researcher concludes that physics teachers at SMA Negeri 4 Polewali who implement the *Merdeka Mandiri Belajar Curriculum* fall into the good category.

#### *Results of Analysis for the Merdeka Mandiri Belajar Curriculum Execution*

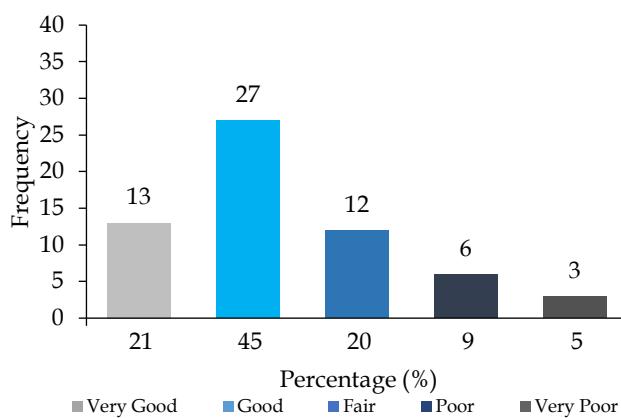
The measurement of learning implementation was conducted using a questionnaire instrument consisting of 19 statement items with 5 alternative answers, from which respondents were required to choose one as their response. Accordingly, the minimum possible score was 5, and the maximum possible score was 95. Based on

these theoretical scores, the frequency distribution for each category can be seen in the following table.

**Table 6.** Percentage of physics teachers' lesson execution levels

Category	Interval	Midpoint	Frequency	Percentage (%)
Very Good	79-95	87	13	21
Good	63-78	71	27	45
Fair	47-62	55	12	20
Poor	31-46	39	6	9
Very Poor	15-30	23	3	5

Based on the frequency distribution in Table 6 above, it can be concluded that the dimension of learning implementation, with a mean score of 65.75, falls into the good category.



**Figure 5.** Histogram of physics learning execution in implementation of the *Merdeka Belajar* curriculum

The execution of the Independent Learning Merdeka Curriculum during the observation followed one of the instructional steps, namely grouping students based on their level of understanding. During the learning process, students were divided into three groups: those who need guidance, proficient students, and advanced students. In the teaching process, the teacher allocated more time to the group that needed guidance, while providing support to the advanced group only when they encountered difficulties.

In the P5 (Project for Strengthening Pancasila Student Profile) implemented by the school, there was collaboration between teachers and students in producing compost fertilizer. Based on interview results related to P5, it was conveyed that the implementation stage in the Independent Learning Merdeka Curriculum is limited to the process stage, and there has not yet been a product harvest or final product exhibition. This implementation is based on the school's capacity and the provisions of the curriculum itself. Product harvesting

may be carried out if the school is capable of continuing the process.

Based on the research data, it can be described that the dimension of learning implementation shows that 21% of physics learning planning was carried out very well, 45% was carried out well, 20% was carried out fairly well, 9% was carried out less well, and 5% was carried out poorly. These findings indicate that physics teachers at SMAN 4 to execution the *Merdeka Mandiri Belajar* fall into good category

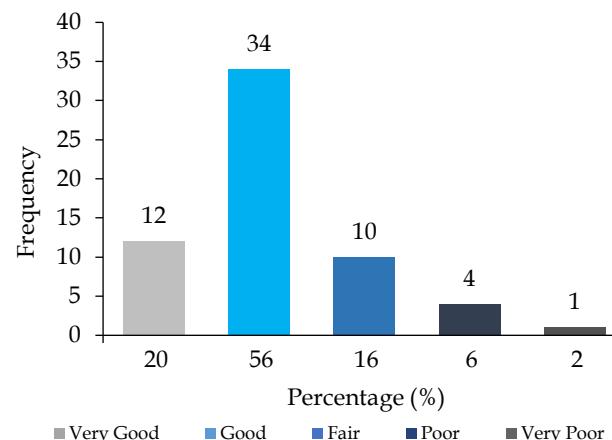
#### Results of Analysis for the *Merdeka Mandiri Belajar Curriculum Assessment*

The measurement of learning assessment was conducted using a questionnaire instrument consisting of 9 statement items with 5 alternative answers, from which respondents were required to choose one as their response. Thus, the minimum possible score was 5 and the maximum possible score was 45. Based on these theoretical scores, the frequency distribution for each category can be seen in the following table.

**Table 7.** Percentage of physics teachers' lesson assessment levels

Category	Interval	Midpoint	Frequency	Percentage (%)
Very Good	41-45	43	12	20
Good	33-40	37	34	56
Fair	25-32	29	10	16
Poor	17-24	21	4	6
Very Poor	9-16	13	1	2

Based on the frequency distribution in Table 7 above, it can be concluded that the learning assessment dimension, with an average score of 35.42, falls into the good category.



**Figure 6.** Histogram of physics learning implementation in the *Merdeka Belajar* curriculum

Although the *Merdeka Curriculum Independent Learning* remains partially tied to the 2013 Curriculum, some teachers have begun to adopt the guidelines of the *Merdeka Curriculum*. Assessment in the *Merdeka Curriculum* includes both formative and summative evaluations. Based on the research findings, the educational institutions involved in this study have implemented both types of assessment. These assessments also involve parents, the community, and other stakeholders, particularly in evaluating the implementation of the P5 program carried out in schools. This aligns with the perspective of Howson & Kingsbury (2023), who assert that the curriculum is a set of intentional and goal-oriented learning experiences, where—in a broader sense—collaborators in the learning process are involved as part of the conceptual framework of educational thinking and practice.

The findings of this study, supported by Wahyuni (2023), indicate that although the implementation of the curriculum in each school is still in progress and not yet fully realized, each school has made earnest efforts to implement the *Merdeka Curriculum*. To ensure effective implementation, strong collaboration and communication among schools, parents, and the government are essential so that the curriculum can be carried out in accordance with its intended goals (Gurion, 2024).

Based on the research findings, the assessment dimension shows that 20% of the learning assessments were carried out very well, 56% were carried out well, 16% were carried out fairly well, 6% were carried out poorly, and 2% were carried out very poorly. These results indicate that physics teachers implementing the *Merdeka Mandiri Belajar Curriculum* in Polewali Mandar Regency have conducted physics learning assessments properly.

## Conclusion

Based on the results of the research and discussion presented in the previous chapter, the following conclusions can be drawn: The lesson planning in the Independent Learning and Independent Sharing *Merdeka Curriculum* includes Learning Outcomes (CP), Learning Objectives (TP), and Learning Objective Pathways (ATP), which are designed directly by the Ministry of Education, Culture, Research, and Technology (Kemendikbudristek) and incorporated into the teaching modules. This planning was found to be well implemented; The execution of teaching, which involves the use of teaching modules collaboratively designed by physics teachers under the *Mandiri Berbagi* and *Mandiri Belajar* *Merdeka Curriculum*, was found in

this study to be carried out effectively; Learning assessment, which includes formative and summative assessments, as well as collaboration with parents, communities, industries, and organizations during the implementation of the Pancasila Student Profile Project (P5), was also found to be successfully implemented in this study.

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## Authors Contribution

Conceptualizing the research idea, research methodology, data analysis, securing funding, thesis development process, original draft writing, software requirements for instructional module design, management responsibilities, and coordination in planning and conducting research activities: M. Writing, reviewing, and editing; supervising and validating the instructional module and research instruments: M. S. A., H. A.

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## Conflicts of Interest

The author declares that there are no conflicts of interest in this research.

## References

Ajani, O. A. (2024). Exploring curriculum transformation in higher education institutions. *Research in Educational Policy and Management*, 217–237. <https://doi.org/10.46303/repam.2024.14>

Al-Fajri, T. A., & Andarwulan, T. (2023). implementation of the merdeka curriculum in indonesia. *Eurodio Journal of Educational Innovation*, 204–212. Retrieved from <https://erudio.ub.ac.id/index.php/erudio/article/view/634>

Amsal, A. E., Arafah, K., & Arsyad, M. (2020). Evaluasi Pembelajaran Fisika SMA Negeri di Kota Makassar dalam Mengimplementasikan Kurikulum 2013. In *Prosiding Seminar Nasional Fisika PPs UNM* (pp. 25–28). Retrieved from <https://ojs.unm.ac.id/semnasfisika/article/download/12872/7972>

Aris, N. A., Arsyad, M., & Abdullah, H. (2024). Development of a physics teaching module based on scientific literacy to improve students' analytical thinking skills. In *Jurnal Penelitian Pendidikan IPA* (pp. 3287-3295). <https://doi.org/10.29303/jppipa.v10i6.7724>

Armita, S., Ekawati, D., Nanda, D. D., & Noviani, D. (2023). Konsep Penerapan Fungsi-Fungsi Administrasi Pendidikan Sekolah. *Pengertian: Jurnal Pendidikan Indonesia*, 219-228. Retrieved from <https://journal.umsurabaya.ac.id/index.php/didaktis/article/download/1874/1491>

Baro'ah, S. (2020). *Kebijakan Merdeka Belajar Sebagai Strategi Peningkatan Mutu Pendidikan*. *Jurnal Tawadhu*. Institut Agama Islam Imam Ghazali. Retrieved from <http://ejournal.iaiig.ac.id/index.php/TWD/article/view/225/162>

Botes, W., & Barnett, E. (2022). The analysis of natural science lesson-plans integrating the principles of transformative pedagogy. *International Journal of Learning, Teaching and Educational Research*, 249-164. <https://doi.org/10.26803/ijlter.21.10.13>

Brummelen, J. V., & Lin, P. (2022). engaging teachers to co-design integrated ai curriculum. *Conference on Human Factors in Computing Systems*, 1-12. <https://doi.org/10.1145/3411764.3445377>

Dhanapala, R. M. (2021). Triangular framework for curriculum. *Open Access Library Journal*. Retrieved from <https://www.oalib.com/articles/6756179>

Drake, S. M., & Sherin, M. G. (2006). Practicing what we teach: Curriculum integration and teacher professionalism. *Journal of Curriculum Studies*, 38(2), 139-158. <https://doi.org/10.1080/00220270500422632>

Gao, R., Merzdorf, H. E., Anwar, S., Hipwell, M. C., & Srinivasa, A. R. (2024). Automatic assessment of text-based responses in post-secondary education: A systematic review. *Computers and Education: Artificial Intelligence*, 1-15. <https://doi.org/10.1016/j.caeai.2024.100206>

Gurion, S. Ben. (2024). Teacher Readiness in Implementing the Merdeka Curriculum. *Journal of Education and Teaching (JET)*, 5(1), 108-118. <https://doi.org/10.51454/jet.v5i1.321>

Hanum, A. (2021). *Dasar-dasar pembelajaran fisika berbasis pengamatan gejala alam*. Jakarta: Pustaka Ilmu Nusantara.

Howson, C. K., & Kingsbury, M. (2023). Curriculum change as transformational learning Teaching. *Teaching in Higher Education*, 28(8), 1847-1866. <https://doi.org/10.1080/13562517.2021.1940923>

Ingram, J. B. (1979). *Curriculum Integration and Lifelong Education*. Britania Raya: Pergamon Press.

Ismayanti, H., Subaer, H. A., & Ramadhan, I. (2024). Development of physics learning media based on augmented reality. *International Journal of Physics and Chemistry Education*, 1-8. <https://doi.org/10.51724/ijpcce.v16i1.362>

Kemendikbudristek. (2022). *Tahapan Implementasi Kurikulum Merdeka di Satuan Pendidikan*. Retrieved from <https://kurikulum.kemdikbud.go.id/wp-content/uploads/2022/07/Tahapan-Implementasi-Kurikulum-Merdeka.pdf>

Kemendikbudristek. (2023). *Surat Edaran: Nomor 0574/H.H3/SK.02.01/2023*. Retrieved from [https://kurikulum.kemdikbud.go.id/File/1675738974\\_Manage\\_File.Pdf](https://kurikulum.kemdikbud.go.id/File/1675738974_Manage_File.Pdf)

Kemendikbudristek. (2024). *Kajian Akademik: Kurikulum Merdeka*. Retrieved from [https://kurikulum.kemdikbud.go.id/File/1711503412\\_Manage\\_File.Pdf](https://kurikulum.kemdikbud.go.id/File/1711503412_Manage_File.Pdf)

Mahardhani, A. J., Nadeak, B., Hanika, I. M., Sentryo, I., & Kemala, R. (2023). A new approach to curriculum development: the relevance of the higher education curriculum to industry needs. *International Journal of Educational Research Excellence*, 501-509. <https://doi.org/10.55299/ijere.v2i2.620>

Mashile, E. O., Fynn, A., & Matoane, M. (2023). Curriculum analytics of an Open Distance Learning (Odl) programme: a data-driven perspective. *South African Journal of Higher Education*, 161-182, 161-182. <https://doi.org/10.20853/37-3-4835>

Mishra, D. N. (2024). Formative and summative review in the classroom. *International Journal of Social Science Research*, 1(1), 54-59. Retrieved from <https://www.ijssr.com/papers/volume-1/issue-1/ijssr30304/>

Noor, T. R. (2022). Urgensi Perencanaan Pembelajaran pada Masa Pandemi. *Edusiana: Jurnal Manajemen Dan Pendidikan Islam*, 34-44. <https://doi.org/10.47077/edusiana.v9i1.203>

Nurfadila, A., Mahyudi, S., M., I., & Arifuddin. (2023). Problems in the Implementation of Independent Curriculum (IC) A Case Study at SMAN 1 Masbagik in academic year 2022/2023. *Jurnal Ilmiah Profesi Pendidikan*, 8(3), 1620-1630. <https://doi.org/10.29303/jipp.v8i3.1471>

Özdemir, S. M. (2019). Implementation of the lesson study as a tool to improve students' learning and professional development of teachers. *Participatory Educational Research*, 36-53. <https://doi.org/10.17275/per.19.4.6.1>

Pela, S. O., Le, N. N., Kaboro, P. G., & Nurjamil, A. (2023). Innovation of physics e-module: utilizing

local wisdom of lampung's handwritten batik in teaching heat and temperature material to foster students' scientific attitude. *Schrödinger: Journal of Physics Education*, 132-138. <https://doi.org/10.37251/sjpe.v4i4.924>

Purba, D., Simatupang, L., Sitorus, M., Manulu, G., & Nababan, A. (2024). Implementasi Kurikulum Merdeka Belajar Pada Pembelajaran Pendidikan Agama Kristen Kelas XI Di SMK St. Nahason Sipohon. *Jurnal Arjuna*, 110-122. <https://doi.org/10.61132/arjuna.v2i3.815>

Putri, Z. F., & Maula, N. (2024). Studi Literatur: Transformasi Kurikulum Indonesia 1947 Sampai Kurikulum Merdeka Dilihat dari Perspektif Model Kurikulum. *Jurnal Teknодик*, 77-93. <https://doi.org/10.32550/teknodik.vi.1160>

Qizi, H. K. (2024). Educational management and curriculum development. *European Journal of Interdisciplinary Research and Development*, 43-46. Retrieved from <https://ejird.journalspark.org/index.php/ejird/article/view/1193>

Schildkamp, K., Kleij, F. M., Heitink, M. C., Kippers, W. B., & Veldkamp, B. P. (2020). Formative assessment: a systematic review of critical teacher prerequisites for classroom practice. *Elsevier: International Journal of Educational Research*, 1-16. <https://doi.org/10.1016/j.ijer.2020.101602>

Sekretariat GTK, G. (2020). *Merdeka Belajar*. Jakarta: Kementerian Pendidikan.

Sudarmini, Y., Kosim, & Hadiwijaya, A. S. (2015). Pembelajaran Fisika Berbasis Inkuiiri Terbimbing Dengan Menggunakan Lks Untuk Meningkatkan Keterampilan Berpikir Kritis Ditinjau Dari Sikap Ilmiah Siswa Madrasah Aliyah Qamarul Huda Bagu Lombok Tengah. *Jurnal Penelitian Pendidikan IPA*, 1(1), 35-48. <https://doi.org/10.29303/jppipa.v1i1.4>

Sudjana. (2013). *Metode Statistika*. Bandung: Tarsito.

Syahrial, A. (2024). Analisis Pembelajaran Fisika Terintegrasi Steam Untuk Melatih Keterampilan Abad 21 Dan Keterampilan Proses Sains Siswa Pada Implementasi Kurikulum Merdeka: A Review. *Journal of Classroom Action Research*, 881-892. <https://doi.org/10.29303/jcar.v6i4.5932>

Syakila, N., & Hidayati, H. (2024). Design of Physics Learning Module Integrated with Problem Based Learning Model on Renewable Energy Material Class X MA. *Journal of Innovative Physics Teaching*, 2(2), 135-147. Retrieved from <https://shorturl.asia/inPUp>

Tain, M., Nassiri, S. H., Meganingtyas, D. E., Sanjaya, L. A., & Bunyamin, M. A. (2023). The challenges of implementing project-based learning in Physics. *Journal of Physics: Conference Series*, 1(6). <https://doi.org/10.1088/1742-6596/2596/1/012068>

Trianto. (2010). *Model Pembelajaran Inovatif Progresif*. Jakarta: Kencana.

Wahyuni, E. (2023). Evaluasi Implementasi Kurikulum Merdeka Belajar di Sekolah. *Jurnal Cendikia Pendidikan Dasar*, 52-58. Retrieved from <http://jcc.ppj.unp.ac.id/index.php/jcpd/article/view/35>

Yamin, M., & Syahrir. (2020). Pembangunan Pendidikan Merdeka Belajar (Telaah Metode Pembelajaran. *Jurnal Ilmiah Mandala Education*, 6. <https://doi.org/10.36312/jime.v6i1.1121>

Zaini, M. (2024). Transformative curriculum development strategy. *International Journal of Educational Research & Social Sciences*, 683-690. <https://doi.org/10.51601/ijersc.v5i4.851>