Jurnal Penelitian Pembelajaran Fisika
Vol. 16 Issue 2 – April 2025, p202-211
p-ISSN 2086-2407, e-ISSN 2549-886X
Available Online at http://journal2.upgris.ac.id/index.php/JP2F
DOI: 10.26877/jp2f.v16i2.1711

Analysis of Physics Assessments Designed by Science Teachers at Junior High School

Febriyanti Suryaningsih[1,2] **, Judyanto Sirait**[1]**, dan Naim Sulaiman**[1]
[1]Physics Education Study Program, Universitas Tanjungpura, Jl. Prof. Dr. H. Hadari Nawawi, Kota Pontianak

[2]E-mail: f1051211025@student.untan.ac.id

Received: 20 February 2025. Accepted: 26 April 2025. Published: 30 April 2025.

Abstract. This study aims to analyze the suitability of physics assessments designed by science teachers at the junior high school level by paying attention to good assessment criteria. This type of research is descriptive-qualitative, involving three teachers in junior high school. The data collection technique is in the form of assessment archive documentation. The assessment analyzed was divided into three documents, namely motion and force, simple aircraft and static electricity. Data analysis techniques are in the form of data reduction, data presentation and conclusion drawn. The design of an assessment needs to pay attention to several aspects in it, namely the suitability of learning objectives to learning outcomes, the suitability of the competencies given, the use of language, the assessment rubric and the answer key in the assessment. Based on the results of the analysis, the assessment designed has included learning objectives, competencies, and achievement indicators. However, some aspects still need improvement, such as the use of operational verbs (KKO) in learning objectives, language consistency, and the completeness of the assessment rubric and answer key. These results show that the assessment has not fully met the optimal criteria to support learning evaluation.

Keywords: physics assessment, science teacher, junior high school

1. Introduction

Learning is the process by which a person acquires knowledge, skills, as well as new attitudes and understanding through experience and teaching [1]. Learning can be obtained formally and informally. Informal learning is obtained through everyday life experiences. Whereas formal experience is obtained through direct instruction, namely school. A learning process needs to be designed so that the learning process can proceed in an orderly manner and produce the desired outcome [1]. In the formal learning process, there is a teacher as the instructor of that learning. A teacher must be able to create a lesson plan to set learning objectives [2]. There are various methods and strategies in the learning process [3]. Teachers must also adjust to the needs and learning styles of students in the classroom. Mastery of the material must be well understood, and assessments should be conducted to measure the understanding of the learned material [4]. For middle school students, the Natural Sciences (IPA) curriculum includes Physics. Physics is a collection of knowledge, ways of thinking, and investigation [5]. In physics education, the material taught is related to our surroundings. Therefore, the main objective of physics education is to develop students' knowledge, understanding, and analytical skills regarding their environment and surroundings [6]. Every task and duty of a science teacher certainly has difficulties in the learning process [7]. Science teachers must be able to adjust the teaching model to align with the learning objectives that students are expected to achieve [3]. Especially the physics material that will be studied by the students. Adjustment of the learning model must also align with the assessment that will be conducted. In this case, a learning evaluation is needed, which is certainly useful for both teachers and students. The evaluation of learning referred to is assessment.

The teaching process is not only limited to conveying knowledge or knowledge, but also involves deep and strategic efforts to create positive changes in all aspects of students. To achieve the desired learning goals, educators must choose the right media and methods. Educators must be able to create a conducive learning environment, be engaging, and encourage students to be actively involved in the learning process [3] as in the current learning curriculum, namely in the independent curriculum. Where the independent curriculum focuses on the character of students, the formation of character is important because it is the goal and demand of producing intelligent students [4]. The implementation of the independent curriculum is very much needed as a character-based and technology-based (digital) learning media with the hope that learning will be more meaningful and can meet the learning needs of students and innovations in learning [5].

Assessment is defined as the evaluation of the process, progress, and learning outcomes of students. Meanwhile, according to Kumano in Maemonah, (in [8]), it is "The process of collecting data that shows the development of learning." Thus, assessment can be defined as an evaluation to determine students' learning progress. Assessment can take the form of tests with challenging questions aimed at honing students' abilities and influencing the extent of their thinking skills [9]. Assessment is divided into two types, namely formative assessment and summative assessment. Formative assessment is an assessment aimed at monitoring and improving the learning process as well as evaluating learning objectives and is usually conducted throughout the learning process [10], [11]. Meanwhile, summative assessment aims to evaluate the achievement of learning objectives (LO) or student learning outcomes (SLO) as a basis for determining class promotion or graduation from the educational institution and is usually conducted at the end of the learning period [12]. The usefulness of assessments is very significant for teachers and students, and even for the students' parents. Through the assessments given by teachers in the learning process, it stimulates students' learning motivation and allows teachers to evaluate learning outcomes to understand students' competencies related to the material being studied [13]. This can happen if the assessment given by the teacher aligns with the objectives to be achieved from the conducted learning. There are several things to consider when designing assessments, namely: 1) Relevant to the learning objectives. 2) High validity, meaning the assessment must measure what it is intended to measure. 3) High reliability, meaning the assessment results are consistent. 4) Fair, the assessment does not benefit or disadvantage students. 5) Practical and easy to implement. 6) The questions designed must be contextual. 7) Contains an assessment rubric. 8) There is an answer key [14].

Based on the research conducted by [15] regarding the implementation of the K13 curriculum by physics teachers in Banda Aceh City. "Physics teachers have not yet been able to use operational verbs (OV) that align with the competencies to be measured in the learning process." In addition, teachers also struggle with the assessment process and the creation of assessment rubrics. This difficulty can result in students not achieving their goals and teachers not knowing which competencies need to be improved. Then, based on research conducted by [16] on teachers at SDN 17 Rejang Lebong. The teachers are hindered in determining assessments that align with the learning objectives to be achieved, one of which is determining assessments during project-based learning. This is confusing for teachers due to the many types or forms of assessments, such as presentations, projects, products, oral, written, and so on [16]. Based on the research that has been observed and the experience during the internship in the 5th semester when assessments were given to students. Analysis of the assessments designed by the science teacher in the physics material needs to be re-evaluated for their alignment with the learning objectives to be achieved.

The novelty of this research compared to the two observed studies lies in the research sample taken. This research was conducted at the junior high school level, whereas the two previous studies were conducted at the elementary and high school levels. This research aims to determine the alignment of learning objectives and assessments provided by teachers in science education at the junior high school level, as well as to assess the alignment of the assessments given with the learning outcomes to be achieved in phase D. This research is limited to assessments designed by science teachers at the junior high school level. The main focus of the research is on the form, content, and alignment of assessments with existing learning objectives and outcomes, derived from formative and summative assessments. In addition, the analysis is only conducted on documents compiled in the last academic year and does not

compare assessments between schools or curricula outside the junior high school level. The benefits of this research are to provide an overview for teachers and prospective teachers regarding the importance of aligning assessments with the competencies to be achieved.

2. Method

This research is a qualitative-descriptive study. This study aims to analyze the suitability of physics assessments designed by science teachers at the junior high school level. This research was conducted at one of the junior high schools in the city of Pontianak. The sample taken in this study consisted of 3 people (science teachers). The data collection technique in the form of archival documentation and the data analysis technique used can be seen in the image 1.

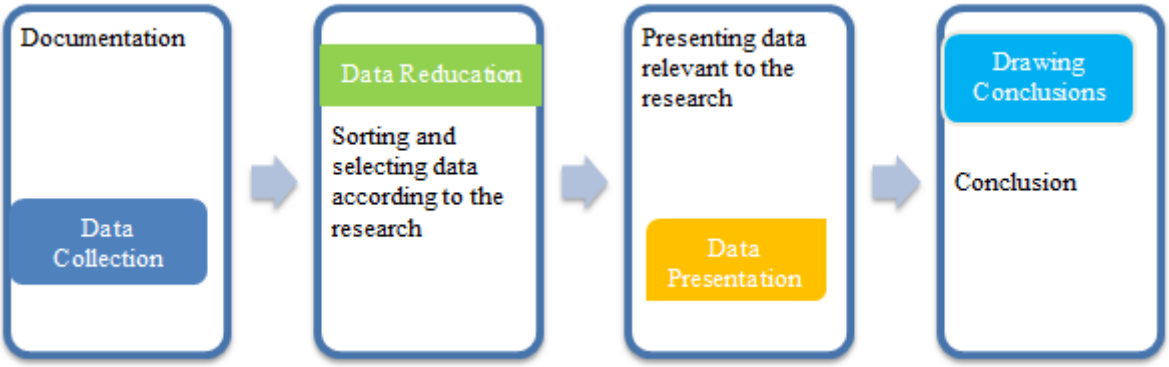


Figure 1. Data collection flow until conclusion.

This research was conducted during the odd semester of the 2024/2025 school year. The stages of this research begin with collecting data that is analyzed from assessment documentation designed by teachers. The assessments analyzed come from seventh- and eighth-grade teachers; the seventh-grade teacher's material is on the physics of motion and force, the eighth-grade teacher's document is on the physics of simple machines, and the ninth-grade teacher's document is on static electricity. The next step is reduction, carried out to centralize, simplify, and abstract the data so that it is organized and easily understandable [17]. The reduced data consists of assessment tools in the form of formative and summative assessments at different educational levels. The data selected for grade VII consists of formative assessments on the topic of motion and force that will be given during the learning process. Next, the selected data for grade VIII consists of a summative assessment on simple machines that will be given at the end of the learning process, and the selected data for grade IX consists of a formative assessment that will be given during the ongoing learning process. Each selected data point specifically relates to the physics material according to the respective grade level. Documents that do not contain physics indicators or originate from other subjects are not included. Then, data presentation aims to organize information in a well-structured manner and enable accurate and precise conclusions to be drawn [18]. Finally, the conclusion stage is carried out with continuous verification and evaluation to ensure that the research results can be interpreted correctly and validly.

3. Results and Discussion

The results of this study were obtained through data collection techniques in the form of documentation with three teachers at one of the junior high schools in the city of Pontianak. This research analyzes the suitability of physics assessments designed by science teachers at the junior high school level. The documentation results obtained come from three teachers with different levels.

3.1. *Assessment Criteria Analyzed*

The table below is a table of assessment characteristics that have been analyzed.

Table 1. Characteristic of the assessment.

Characteristics	Class		
	VII	VIII	IX
Material	Motion and Force	Simple Machinery	Static Electricity
Learning Objectives	Students can understand the concepts of displacement, velocity, and acceleration.	Classifying types of simple machines Showing a type of simple aircraft	Understanding the concept of static electricity, electric charge, electric potential, electrical conduction, electricity in the nervous system, and examples in animals that produce electricity
Type of Assessment	Formative assessment	Summative assessment	Formative assessment
Assessment Form	Essay	Multiple choice and matching	Multiple choice
Number of Questions	Four questions	Three questions	Ten questions

Table 1 presents the assessment characteristics obtained from the three teachers. Overall, the assessment characteristics analyzed in this teacher assessment are divided into four categories [23], based on assessments from three different classes. The assessment topics include 1) Material, 2) Learning objectives, 3) Types of assessment, 4) Forms of assessment, and 5) Number of questions [22], [25], [26]. The assessment analyzed in the seventh grade is the topic of motion and force with a formative assessment type [27]. The learning objective for this material is for students to understand the concepts of displacement, velocity, and acceleration, with the formative assessment in the form of an essay consisting of four questions. Next, the assessment analyzed in the eighth grade is the simple machines material with a summative assessment type [24]. The learning objectives for this material are to categorize types of simple machines and demonstrate types of simple machines with assessment forms consisting of two multiple-choice questions and one matching question. The assessment analyzed in the IX grade on static electricity material with a formative assessment type [28]. The learning objectives of this assessment are to understand the concepts of static electricity, electric charge, electric potential, electrical conduction, electricity in the nervous system, and examples in animals that contain electricity, presented in the form of ten multiple-choice questions.

3.2. *Discussion*

Below are three tables, namely table 2, table 3, and table 4, which contain the results of the physics learning assessment analysis designed by the teacher.

Table 2. Formative assessment of motion and force.

The aspect analyzed	Explanation
The alignment of learning objectives with learning outcomes	The alignment of learning objectives is quite in accordance with the learning outcomes.
The competencies provided align with the learning objectives.	Question number 1 is already in line with the learning objectives. Questions number 2, 3, and 4 are quite in line with the learning objectives.
The use of proper and correct Indonesian language	The use of Indonesian in this question is quite appropriate.
Assessment rubric	It is already in accordance and stated in the assessment.
Answer key for the question	Not appropriate and not listed in the assessment

Table 2 shows the results of the motion and force assessment analysis with a formative assessment type. In the aspect of the alignment of learning objectives with learning outcomes, the learning objectives formulated by the teacher are quite adequate in fulfilling the components that must be present in the learning objectives, namely competencies and the scope of the material [19]. However, in the component of competencies to be achieved, operational verbs are not used. However, the scope of the material to

be achieved is already in line with the material to be taught in seventh grade and is reflected in the learning outcomes. Then the competency aspect or the questions designed are in accordance with the learning objectives. In this aspect, out of the four questions in this formative assessment, one question designed aligns with the formulated learning objective, which is to understand the concept of acceleration. The relevant competency or question can be seen in Figure 2.

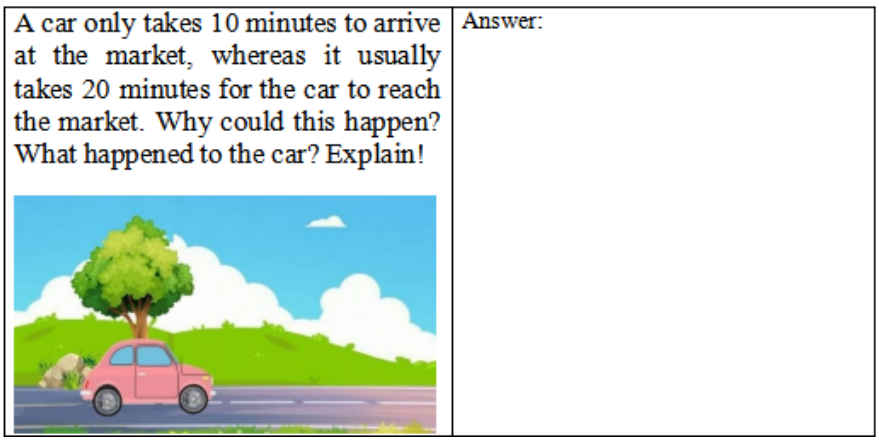


Figure 2. Example of motion and force assessment questions.

Three other questions fall into the category of being fairly appropriate because these three questions focus on computational skills rather than comprehension. One of the questions that falls into the category of being quite aligned with the learning objectives can be seen in Figure 3.

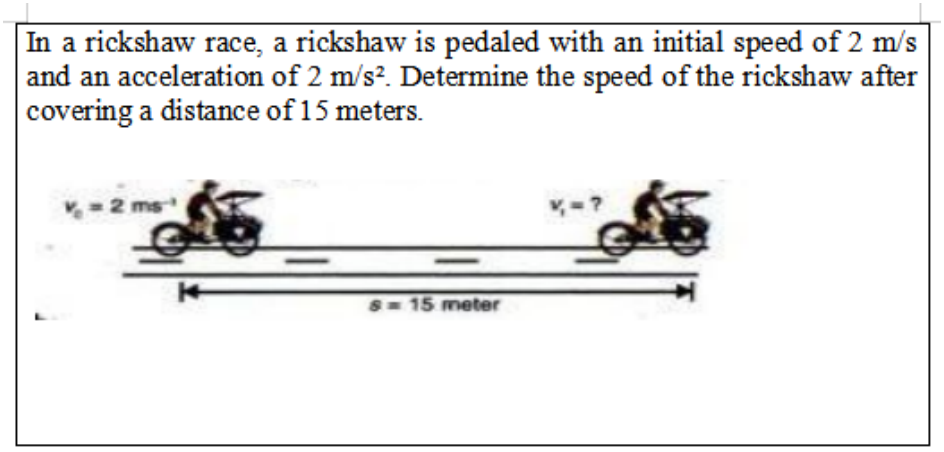


Figure 3. Example of motion and force assessment questions that are quite appropriate.

The next aspect to be analyzed is the use of language. The language used in the questions is quite appropriate, using proper and correct Indonesian. However, the writing rules in the questions still need to be improved. As shown in figure 2 above, the writing of the preposition at the beginning of the sentence does not use a capital letter. The first letter of the first sentence should be capitalized, not in lowercase. In this assessment, there is a rubric used to evaluate three aspects: attitude, knowledge, and skills. The assessment rubric can be used by teachers to measure the achievement of ongoing learning objectives [20]. The next aspect analyzed is the presence of an answer key in the assessment. In this aspect, the answer key does not match the questions because it does not contain the correct answers. Ideally, the answer key should be included in the assessment, as it serves as a reference for evaluating students' answers. In addition, the answer key is also used as a guide in solving the given problems so that students' answers can be assessed in a measurable and clear manner [21].

Table 3. Simple machine summative assessment.

Aspect that is analyzed	Explanation
The alignment of learning objectives with learning outcomes	The alignment of learning objectives is quite in accordance with the learning outcomes
The competencies provided align with the learning objectives.	Questions number 1 and 2 are in accordance with the learning objectives Question number 3 is quite in line with the learning objectives
The use of proper and correct Indonesian language	The use of Indonesian language is quite appropriate
Assessment rubric	The assessment rubric does not match the existing assessment
Answer key for the question	The answer key is quite consistent with the questions

Table 3 shows the results of the simple aircraft assessment analysis with a summative assessment type. On the aspect of the alignment of learning objectives with learning outcomes. The formulated learning objectives are appropriate and meet the two components that must be present in learning objectives, namely the competency component and the scope of the material [19]. The knowledge to be achieved in the learning objectives of simple machines is that students can categorize and demonstrate the types of simple machines. In this competency, the words used already employ operational verbs (OV). Next, the alignment of the question competencies with the learning objectives. This assessment is a summative assessment used to measure the achievement of learning objectives at the end of phase D of grade VIII. There are three questions given on the topic of simple machines. Two of the questions are in line with the learning objectives to be achieved with clear question indicators. One of the two questions that align with the learning objectives can be seen in Figure 4.

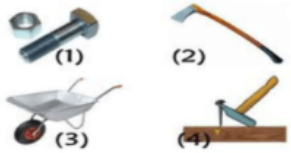
17	Classifying types of simple machines	Presented with images of several tools used in daily life, students can categorize the types of simple machines.	simple machines	C3	 17. Look at the picture beside! The group of simple machines similar to the lever is…. A. 1 and 4 B.2 and 3 C.2 and 4 D.3 and 4	D	15

Figure 4. Example of a Suitable Simple Machine Assessment Question

However, in another question, as seen in figure 5 below, the obtained category is quite appropriate. This happens because the given question does not fully align with the formulated objectives. The indicators in the question require students to identify types of simple machines in a matching assessment format. Therefore, although this question is quite appropriate, some improvements are still needed. If the form of the question used is matching, it is better to include figure and descriptions separately. Thus, students can match the available figure with the corresponding types of simple machines, such as levers, pulleys, and inclined planes.

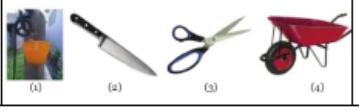
4	Showing the types of simple machines	Students can demonstrate the types of simple machines	Simple machines	C3	34. It is a type of.... 	3,4	Simple machines	2

Figure 5. Example of a simple machine assessment question that is quite appropriate.

The language used is Indonesian and falls into the category of being quite appropriate. This is because in the use of language, there are still writing errors such as missing letters in sentence construction. Then, in the information provided in the questions, sometimes the information is inconsistent. This inconsistency can be seen in figure 4, where, in the provided information, students are instructed to pay attention to the image on the side, whereas the attached figure is above. Then, the next observed aspect is the presence of an assessment rubric in which the resulting categories are not appropriate. Because there is no assessment rubric for the summative assessment that will be given. However, the score for each question has already been determined by the teacher. The last aspect is that there are answer keys for the questions. In this aspect, the resulting category is quite appropriate, because each question to be given has an answer key, but the provided answers do not show the reasoning behind the answer key [21].

Table 4. Static electricity formative assessment.

The aspect analyzed	Explanation
The alignment of learning objectives with learning outcomes	Already sufficiently aligned with the learning outcomes.
The competencies provided align with the learning objectives.	Questions number 3, 4, and 10 are already aligned with the learning objectives. Questions number: 1, 2, 3, 5, 6, 7, 8, and 9 are sufficiently aligned with the learning objectives.
The use of proper and correct Indonesian language	The questions used in this assessment are quite appropriate
Assessment rubric	The assessment rubric is not appropriate
Answer key for the question	The answer key is sufficient appropriate

Question number 4

Basic Competencies	3.4 Understanding the concept of static electricity, electric charge, electric potential, electrical conduction, and electricity in the nervous system, along with examples in animals that produce electricity.
Indicator question	Identifying the types of electric charges (C1)
Technique	Written test
Question: There are 4 electrically charged objects A, B, C, and D. Object A and B attract each other, B and C repel each other, and C and D attract each other. If object A turns out to be a glass rod that has been rubbed with a silk cloth, the correct statement is.... A. B and C have a negative charge, D has a positive charge. B. B and C have a positive charge, D has a negative charge. C. B has a positive charge, C and D have negative charges. D. B has a negative charge, C and D have positive charges.	
Keyword: A	

Figure 6. Example of a suitable static electricity assessment question.

Table 4 shows the results of the analysis of static electricity material assessment with a formative assessment type. In the aspect of the alignment of learning objectives with the material, it falls into the category of fairly appropriate. The formulated learning objectives have met the two components that must be present in learning objectives, namely competence and scope of material [19]. However, the use of verbs in the knowledge to be achieved has not yet employed operational verbs [11]. The next aspect is the competencies created in accordance with the learning objectives. There are ten questions given in this formative assessment in the form of multiple-choice questions. Questions number 3, 4, and 10 meet the appropriate category. In the questions that meet the appropriate category, the questions are designed according to the learning objectives to be achieved, such as question number four in figure 6.

Next, questions number 1, 2, 3, 5, 7, 8, and 9 fall into the sufficiently appropriate category. This is because the questions do not meet the indicators set for them. One of the questions that is quite aligned with the learning objectives appears as shown in Figure 7.

Question number 8

Basic Competencies	3.4 Understanding the concept of static electricity, electric charge, electric potential, electrical conduction, and electricity in the nervous system, along with examples in animals that produce electricity.
Indicator question	Analyzing the event that occurs when a plastic ruler is rubbed on dry hair (C4)
Technique	Written test

Observe the following figure!
The plastic comb can attract the paper fragments shown in the picture, because..

	Rubbed with	The events that occurred	Type of cargo
A	Wool fabric	Losing several electrons	Positive
B	Silk fabric	Losing several electrons	Positive
C	Wool fabric	Getting an additional electron	Negative
D	Silk fabric	Getting an additional electron	Negative

Keyword: C

Figure 7. Example of a static electricity assessment question that is quite appropriate.

Next, the aspect of using proper and correct Indonesian language falls into the fairly appropriate category. The language used is Indonesian, but there are errors in the use of several words in writing proper and correct Indonesian. As seen in figure 6 and 7, every writing of the word "nomor" in the questions is written as "nomer." This is an error in the use of the Indonesian language rules. Next, there is an aspect of the assessment rubric. Based on the analyzed assessment, there is no scoring rubric provided for this assessment, and this aspect falls into the category of not being appropriate. The last aspect observed is the presence of an answer key, which falls into the category of fairly appropriate. The assessment provided does indeed include answer keys for each question; however, the answer keys are not accurately attached, and the reasoning for the answers in the answer keys is lacking [21].

4. Conclusion

Assessment is very useful for teachers to see the extent of the learning outcomes achieved. The assessment given can be conducted at the beginning of the learning process, during the learning process, and at the end of the learning process. The design of an assessment needs to consider several aspects within it, namely the alignment of learning objectives with learning outcomes, the appropriateness of

the competencies provided, the use of language, the assessment rubric, and the answer key in the assessment. Based on the analysis results, the designed assessment has included learning objectives, competencies, and achievement indicators. However, several aspects still require improvement, such as the use of operational verbs (OV) in learning objectives, language consistency, and the completeness of assessment rubrics and answer keys. These results indicate that the assessments prepared do not yet fully meet the optimal criteria to support learning evaluation.

Acknowledgments
The author expresses gratitude to the FKIP Universitas Tanjungpura (UNTAN) for supporting the implementation of MBKM Research in 2024. Thank you to the Physics Education Study Program at FKIP UNTAN for all the support and facilities provided.

References
[1] Fitriyah L A and Hayati N 2020 Analisis Keterampilan Menyusun Rpp Mahasiswa Calon Guru Ipa Menggunakan Active Learning *LENSA (Lentera Sains) J. Pendidik. IPA* **10**, 2 p. 83–93.
[2] Suryapermana N 2017 Manajemen Perencanaan Pembelajaran *Tarbawi J. Keilmuan Manaj. Pendidik.* **3**, 02 p. 183.
[3] Sutikno, M S 2021, Strategi Pembelajaran, in *Penerbit Adab*, (Penerbit Adab).
[4] Heryahya A Herawati, Endang, Sri B Susandi, Ardi D and Zulaiha F 2022 Analisis Kesiapan Guru Sekolah Dasar Dalam Implementasi Kurikulum Merdeka *J. Educ. Instr.* **5**, 2 p. 548–562.
[5] Astuti S P 2015 Pengaruh Kemampuan Awal dan Minat Belajar terhadap Prestasi Belajar Fisika *Form. J. Ilm. Pendidik. MIPA* **5**, 1 p. 68–75.
[6] Azizah, R; Yuliati, L; Latifah E 2015 Kesulitan Pemecahan Masalah Fisika Pada Siswa SMA *J. Penelit. Fis. Dan Apl.* **5**, 2 p. 44–50.
[7] Wibowo Imam Suwardi F R 2018 Hubungan Peran Guru Dalam Proses Pembelajaran Terhadap Prestasi Belajar Siswa Imam Suwardi Wibowo , Ririn Farnisa *J. Gentala Pendidik. Dasar* **3**, 2 p. 181–202.
[8] Baruta Y, 2023, Asesmen Pembelajaran Pada Kurikulum Merdeka: Pendidikan Anak Usia Dini, Pendidikan Dasar, dan Pendidikan Menengah, in *Penerbit P41*, (Lombok).
[9] Liana N Suana W and Sesunan F 2018 Pengembangan Soal Tes Berpikir Tingkat Tinggi Materi Fluida Untuk Sma *J. Komodo Sci. Educ.* **01**, 01 p. 66–78.
[10] Mujiburrahman, M; Kartiani, B, S; Parhanuddin L 2023 Asesmen Pembelajaran Sekolah Dasar Dalam Kurikulum Merdeka *Pena Anda J. Pendidik. Sekol. Dasar* **8**, 1 p. 39–40.
[11] Ramadhani D P 2021 Analisis Penerapan Asesmen Formatif Dalam Pembelajaran Ipa Dan Fisika : Literature Review *LENSA (Lentera Sains) J. Pendidik. IPA* **11**, 2 p. 110–120.
[12] Nur Budiono A and Hatip M 2023 Asesmen Pembelajaran Pada Kurikulum Merdeka *J. Axioma J. Mat. dan Pembelajaran* **8**, 1 p. 109–123.
[13] Priyanto A Hartoyo A and Noviani E 2024 Pengembangan Asesmen Pembelajaran Matematika untuk Menguji Kemampuan Bernalar Kritis dan Kreatif Siswa Sekolah Menengah Atas *J. Educ. Res.* **5**, 2 p. 1139–1146.
[14] Ramatni A Anjely F Cahyono D Rambe S and Shobri M 2023 Proses Pembelajaran dan Asesmen yang Efektif *J. Educ.* **05**, 04 p. 15729–15743.
[15] Ernawati E and Safitri R 2017 Analisis Kesulitan Guru Dalam Merancang Rencana Pelaksanaan Pembelajaran Mata Pelajaran Fisika Berdasarkan Kurikulum 2013 Di Kota Banda Aceh *J. Pendidik. Sains Indones.* **5**, 2 p. 49–56.
[16] Zulaiha, S; Meisin, M; Meldina T 2023 Problematika Guru Dalam Menerapkan Kurikulum Merdeka Belajar *Terampil J. Pendidik. Dan Pembelajaran Dasar* **9**, 2 p. 81–95.
[17] Rijali A 2019 Analisis Data Kualitatif *Alhadharah J. Ilmu Dakwah* **17**, 33 p. 81.
[18] Zulfirman R 2022 Implemetasi Metode Outdoor Learning Dalam Peningkatan Hasil Belajar Siswa Pada Mata Pelajaran Pendidikan Agama Islam Di Man 1 Medan *J. Penelitian, Pendidik. danPengajaran* **3**, 2 p. 147–153.
[19] Murwantini S 2023 Optimalisasi Asesmen Untuk Sekolah Menengah Kejuruan Pada Kurikulum Merdeka *Steam Eng.* **4**, 2 p. 105–113.

[20] Suwarto, 2013, Pengembangan Tes Diagnostik Dalam Pembelajaran, in *Yogyakarta: Pustaka Pelajar* .
[21] Alan Putra Pardede Cecilia Simanullang Emmita Founda Bangun and Syahrial 2024 Analisis Pengembangan Instrumen Penilaian Formatif untuk Meningkatkan Prestasi Belajar Siswa Sekolah Dasar Pada mata Pelajaran IPA *JPGENUS J. Pendidik. Gener. Nusant.* **2**, 1 p. 127–133.
[22] Ritonga, R; Harahap, R., Adawiyah, R 2023 Pendampingan Guru Sekolah Penggerak Dalam Menganalisis Prinsip Asesemen dan Prinsip Pembelajaran Pada Kurikulum Merdeka *J. Pengabdian Masyarakat Nusant.* **3**(1), 164-174.
[23] Kemendikbudristek 2022 Pembelajaran dan Asesmen Pendidikan Anak Usia Dini,Pendidikan Dasar dan Menengah, in *Jakarta: Badan Standar Kurikulum dan Asesmen Pendidikan*
[24] Munaroh and Natasya Lady 2024 Asesmen dalam Pendidikan: Memahami Konsep, Fungsi dan Penerapannya *Dewantara J.Pendidikan.Sosial.Humaniora.* **3**, 3: 281-297.
[25] Sirait Judyanto 2024 Merancang Asesmen Fisika Menggunakan Evidance- Centeral Design (ECD) dan Three-Dimensional Learning Protocol (3D-LAP) *J. Pendidikan. Informatika dan. Sains.* **13**,12 : 165-175.
[26] Gusman Yuli 2024 Asesmen dalam Pendidikan: Konsep, Pendekatan, Prinsip, Jenis dan Fungsi. *J. Pendidikan. Bahasa. dan Budaya*. **3**,3: 170-190.
[27] Hulu, H. K., Sirait, J., Firdaus, F., & Balta, N 2025 Development of Linear Motion Assessment Using Evidence-Centered Design. *Jurnal IPA & Pembelajaran IPA*, **9**(1), 49-64.
[28] Novieyanti, A., Sirait, J., Habellia, R. C., & Sulaiman, N 2025 Development Of Work And Energy Assessment With Evidence-Centered Design Approach. *Journal of Teaching and Learning Physics.* **10**(1), 21-31.