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Teachers' Perception of Four-Tier Diagnostic Test Instrument Equipped with Self-Diagnosis Sheet to Identify Students' Misconception on Linear Motion Material

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Abstract: The purpose of this study was to determine the perception of physics teachers towards the four-tier diagnostic test instrument equipped with self-diagnosis sheet to identify students' misconceptions on linear motion material. The research method used in this study is a mixed method with Sequential Explanatory Design. Data were collected first using a questionnaire and then analyzed using descriptive analysis. The questionnaire was distributed to 14 physics teachers and 96 high school students in Lampung Province. The results showed that teachers have a positive perception of the use of a four-tier diagnostic test instrument equipped with a self-diagnosis sheet feature to identify students' misconceptions on straight motion material. The results showed that 87% of teachers had never identified students' misconceptions on straight motion material. The results also show that 90% of teachers only use the results of daily tests as a benchmark to determine the misconceptions experienced by students. Misconceptions in this straight motion material certainly affect the learning outcomes of students, it is known that only 46% of students reach the KKM on straight motion material. And the results of the questionnaire show that 95% of teachers have never identified the misconceptions of students on linear motion material to make and use any type of multilevel diagnostic test instrument because the teacher has no difficulty in making it. So an effort is needed to overcome these problems, namely by making valid, practical, and effective multilevel diagnostic test instruments. Based on the results of the study, it can be concluded that a four-tier diagnostic test instrument equipped with a self-diagnosis sheet is needed to identify students' misconceptions on linear motion material.

Keywords: Four-tier diagnostic test instrument; Linear motion; Misconceptions

Introduction

Education greatly affects the progress of a country and world civilization, if a country's education system is good, it will create more productive human resources. The future progress of a country is largely determined by the ability of a nation's human resources to master science and technology. Education can change the personality and character of the nation, education can also change a nation to become more advanced and can improve the quality of human resources (Safitri et al., 2022). Efforts to improve the quality of human resources require quality education as well.

The government has made many efforts in realizing quality education at every level of education, namely by using a curriculum that is developed according to the needs of students. Indonesia in 2022 is in a period of curriculum transition, namely the transition from the

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2013 revised curriculum to the independent curriculum. This curriculum change is inseparable from following the era of digitalization. This digitalization era is a benchmark for the emergence of an independent curriculum (Ningrum, 2022). The use of an independent curriculum according to Priantini et al. (2022) is in accordance with the Indonesian government's efforts to realize an increase in the quality of education that is relevant to the characteristics of 21st century learning. Quality education is able to develop all the potential of students. Quality education must be realized in all subjects, one of which is physics.

Physics is a subject that studies the universe to practice thinking and reasoning. The reasoning ability of students who continue to be trained makes their thinking develop, so students will increase their thinking power and knowledge (Maulidina et al., 2020). Physics learning objectives direct students to understand the concepts, laws, principles and theories of physics that are useful for solving problems in everyday life related to various natural phenomena and lead to conceptions that are built by students (Rosuli et al., 2019).

At the end of the physics learning process, students are only expected to obtain information about the things that have been taught. Students are required to understand the concept not just knowing the formula, because physics has formulas, concepts, laws, principles and events of everyday life. The number of abstract concepts is difficult to capture by logical thinking (Agata et al., 2019). Learners know the formula but do not understand the concept, learners understand the concept but do not understand the working principles of the concept in everyday life (Maulidayah & Zainuddin, 2022). It will be difficult to distinguish between students who understand the concept and do not understand the concept. For this reason, it is necessary to distinguish between students who understand the concept and students who have the wrong concept and even do not know the concept.

Learners' efforts in understanding concepts are sometimes influenced by the prior knowledge they see in everyday life. Concept understanding is considered a complex phenomenon, consisting of factual, procedural and conditional knowledge (Viyanti et al., 2016). Learners have initial knowledge of a concept from the phenomena they see themselves in everyday life. This initial concept is brought into the classroom so that students already have initial knowledge of a concept. So that it raises alternative concepts that are not in accordance with the concepts conveyed by scientists which causes students to experience misconceptions in physics learning. But in reality, based on the results of previous research conducted by Paramita et al. (2024), most students show that the conceptions that students build are not in accordance with the concepts conveyed by scientists or it can be said that students experience misconceptions.

Misconception is referred to as an incorrect or inappropriate understanding of certain concepts or can be said to be a conception that is not in accordance with the scientific understanding accepted by scientists (Sarni et al., 2023). Misconceptions or misconceptions can hinder mastery of subsequent material concepts (Khairaty et al., 2018). Misconceptions can occur due to structural misclassification of information obtained by students (McAfee et al., 2021). Learners do not realize that they have misconceptions because these students believe that their concepts are correct. Apart from being caused by students, misconceptions can also be caused by educators who teach, learning contexts, teaching methods and textbooks (Putri et al., 2021). Misconceptions that if not overcome will cause learning difficulties for students in understanding the next concept (Istiyono et al., 2023). In addition, if misconceptions are not addressed properly, misconceptions will have a negative impact on student learning outcomes (Salsabila et al., 2024).

This is also in accordance with the results of preliminary research conducted on 14 high school physics teachers who obtained information that in physics learning often occurs misconceptions that cause student learning outcomes are not achieved. One of the physics materials that do not achieve good learning outcomes is straight motion material. The lowest daily test results of XI MIPA class students at SMAN 1 Terusan Nunyai, Bandar Lampung Culture High School, and SMAN 9 Bandar Lampung were on straight motion material, where only 45.97% of students reached the KKM. Based on research conducted by Wibowo (2018) found that students did not understand straight motion material and were less successful when working on questions related to the material, this was because it was based on the lack of interest of students in the lesson and the delivery of material using the lecture method which made students bored.

Misconceptions are fatal to the learning process, especially physics concepts that are interrelated with each other. In addition, misconceptions cannot be generalized directly because each student experiences different misconceptions. So that students' concept understanding becomes low, the completeness of students' learning outcomes is not achieved and the application of physics concepts will be difficult for students to apply in their daily lives. Therefore, a tool is needed to diagnose students' misconceptions.

Efforts to diagnose students' misconceptions require tools in the form of instruments (Diani et al., 2019). Instruments to diagnose students' misconceptions can use diagnostic test instruments (Jumilah et al., 2023).

Diagnostic tests are one of the right treatments to help teachers get information about students' conceptual errors in physics material. Diagnostic tests are in the form of multiple choice tests that have several levels. There are several forms of multiple choice diagnostic tests including: one-tier multiple choice diagnostic tests, two-tier diagnostic tests, three-tier diagnostic tests, four-tier diagnostic tests. The independent curriculum uses diagnostic tests to find out the weaknesses of each student and provide the right solution in taking further action. So that the results of student learning completeness can increase and be achieved according to school standards. The four-tier diagnostic test instrument according to Istiyono et al. (2023) is an effective way to find out the misconceptions that occur in students.

The four-tier diagnostic test instrument is designed to determine how strong learners master concepts through the level of confidence in answering questions. In addition, to find out the extent to which students are able to solve problems and what difficulties students experience when solving these problems, the diagnostic test instrument can be equipped with a self-diagnosis sheet (Dendodi et al., 2020). Sarni et al. (2023) argue that given the importance of teachers' ability to develop four-tier diagnostic test instruments to identify students' misconceptions, it is necessary to hold training activities for the preparation of misconception questions. However, there has been no research on the four-tier diagnostic test instrument equipped with a self-diagnosis sheet to identify students' misconceptions on straight motion material.

Method

The participants of this study consisted of 14 respondents who were physics teachers and 96 respondents who were high school students in Class XI MIPA in the 2023/2024 academic year. This study used a mixed research method adopted from Creswell (2002) by combining Sequential Explanatory Design data collection strategies and qualitative and quantitative data analysis. This research was conducted on March 18-22, 2023 at SMAN 1 Terusan Nunyai, SMA Budaya Bandar Lampung, and SMAN 9 Bandar Lampung. The first step taken by the researcher was to conduct a literature review of the latest research results regarding the use of diagnostic test instruments, misconceptions, and learning outcomes. Then the researcher developed a needs analysis instrument in physics learning, then the instrument was distributed to 14 physics teachers and 96 high school students in Class XI MIPA at SMAN 1 Terusan Nunyai, SMA Budaya Bandar Lampung, and SMAN 9 Bandar Lampung through Google Form. The research design scheme is shown in Figure 1.

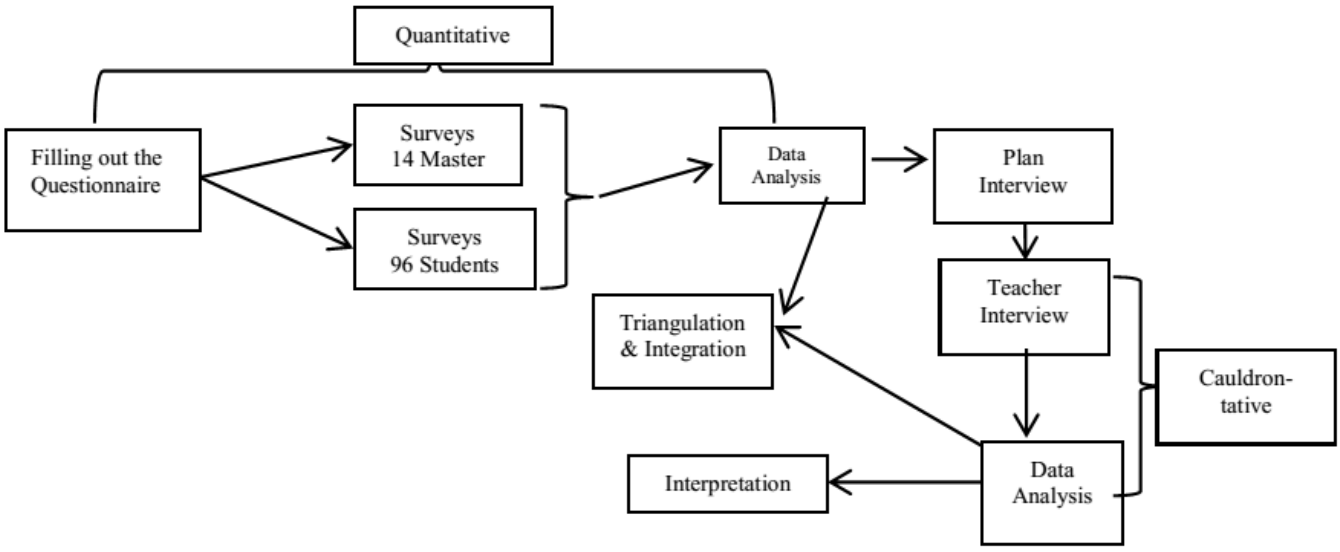

Figure 1. Schematic research design

Data analysis techniques used in this research are data collection, data reduction, display and verification. Data collection begins with the process of entering researchers into research locations conducted at SMAN 1 Terusan Nunyai, SMA Budaya Bandar Lampung, and SMAN 9 Bandar Lampung, after the data is collected then reduced and focused on important things related to the core of the research, stabilization also eliminates unnecessary data, then summarized completely and systematically so that the research data is obtained accurately, then the final stage is to present the data and draw conclusions obtained from the initial data to the end and verification. After the data is described, it can be verified through the completeness of the interview

data and documentation. Then interviews were conducted covering respondents' responses regarding the learning process carried out at school. This interview was conducted to find out the respondents' reasons for the importance of knowing students' learning difficulties in straight motion material, the importance of using misconception measurement tools, and the importance of using a four-tier diagnostic test instrument equipped with a self-diagnosis sheet feature in measuring students' misconceptions.

Quantitative and qualitative data analysis is carried out in an integrated and triangulated manner. The research data were obtained from teachers and students, then the results of the questionnaire were analyzed by grouping the scores, and giving a score to each answer according to the assessment criteria, calculating the total score of the answers to each question, The questionnaire uses a Guttman scale which has answer options according to the content of the question, namely: "Yes" and "No" with a score of "1" and "0". Then calculatedscore percentage and interpreted qualitatively, the formula used to calculate the score percentage for each item is as follows:

$$\% \text{ Jin} = \frac{\sum \text{Ji}}{N} \; x \; 100\% \quad (1)$$

where,% Jin is the percentage of choice answer i, $\sum Ji$ is the number of respondents who answer the answer i, and N is the number of all respondents (Sudjana, 2005).

Result and Discussion

The following is part of the discussion and research findings based on the data analysis found. The results of distributing the questionnaire to 14 physics teachers in the lampung province are shown in Table 1.

Table 1. Results of Interpretation of Teacher's Perception Questionnaire

Question	Percentage (%)	
	Yes	No
Have you ever taught linear motion material?	100%	0%
Do you always open physics lessons starting with natural phenomena around students related to linear motion material?	33%	67%
Do you always provide opportunities for students to give their opinions after seeing natural phenomena related to linear motion material?	47%	53%
Do you often find answers that are not in accordance with the concepts on linear motion material?	85%	15%
Do you understand that students' misconceptions can cause students' understanding of a concept to be inconsistent (aligned)?	85%	15%
Have you ever analyzed students' difficulties in linear motion material?	37%	63%
Has the average student learning outcome met the (KKM)?	46%	54%
Do you always help learners to understand their level of understanding, identify weaknesses, and develop more effective learning strategies through assessment activities?	40%	60%
Does the assessment instrument always encourage students' deep understanding rather than just memorization?	38%	62%
Have you ever analyzed students' misconceptions on linear motion material?	13%	87%
In analyzing students' misconceptions on linear motion material, do you make your own instruments?	8%	92%
Do you use diagnostic test instruments to find out students' misconceptions on linear motion material?	10%	90%
Do you know the misconceptions of students on straight motion material only based on the results of daily tests and approaches?	90%	10%
Have you ever made a diagnostic test instrument to identify students' misconceptions?	8%	92%
Have you ever created a multilevel diagnostic test instrument to identify students' misconceptions?	5%	95%
Have you ever made a four tier diagnostic test instrument to identify students' misconceptions on linear motion material?	5%	95%
Do you have difficulty making diagnostic test instruments to identify students' misconceptions?	90%	10%
Do you always agree if the *four tier* diagnostic test instrument with *self- diagnosis sheet* feature is applied to identify students' misconceptions on linear motion material?	96%	4%

Table 1 illustrates that all physics teachers in the independent curriculum have not fully used diagnostic tests in identifying misconceptions, therefore they realize the importance of using diagnostic tests in identifying misconceptions in the evaluation process in the independent curriculum. The independent curriculum emphasizes optimizing learning outcomes according to student capacity. The learning objectives of Physics direct students to understand the concepts, laws, principles and theories of Physics which are useful for solving problems in everyday life related to various natural phenomena and lead to conceptions that are built by students (Rosuli et al., 2019).

However, based on previous research conducted by Paramita (2024), most students show that the conceptions that students build are not in accordance with the concepts conveyed by scientists or it can be said that students experience misconceptions. Misconception

is referred to as a wrong or inappropriate understanding of certain concepts or can be said to be a conception that is not in accordance with the scientific understanding accepted by scientists (Sarni et al., 2023). Misconceptions that if not overcome will cause learning difficulties for students in understanding the next concept (Istiyono et al., 2023). In addition, if misconceptions are not addressed properly, misconceptions will have a negative impact on student learning outcomes (Salsabila et al., 2024).

This is in accordance with the results of research conducted on 14 high school physics teachers who obtained information that in physics learning often occurs misconceptions that cause student learning outcomes are not achieved. One of the physics materials that did not achieve good learning outcomes is linear motion material. It is known that 100% of teachers have learned linear motion material to XI MIPA class students. The results of the daily test of linear motion material are very low, where only 46% of students reach the KKM. It is known that in teaching linear motion material only 47% of teachers provide opportunities for students to give their opinions about natural phenomena related to linear motion material and 85% of teachers often find answers that are not in accordance with the concepts in straight motion material submitted by students. 85% of teachers feel that understanding the misconceptions experienced by students can cause students' understanding of a concept to be inconsistent (aligned). It is also known that 63% of teachers have never analyzed students' difficulties in linear motion material. Only 40% of teachers help students to understand the level of understanding of students, identify weaknesses, and develop more effective learning strategies through assessment activities, 62% of teachers make assessment instruments that always encourage deep understanding of students not just memorization.

Assessment design that is oriented is needed to the needs of learners. This assessment can be done at the beginning of learning or at the end of learning (Nur Budiono et al., 2023). Assessment is a systematic and continuous process or activity to collect information about the process and learning outcomes of learners in order to make decisions based on certain criteria and considerations (Nasution, 2023). The information processing process is carried out using analytical techniques and procedures in accordance with the assessment criteria (Viyanti et al., 2022). This information can be in the form of student abilities, interests, attitudes and motivation. The use of the term evaluation refers to determining the quality of student learning outcomes. This activity is carried out by comparing the measurement results with predetermined criteria (Indrastoeti et al., 2017).

In the independent curriculum, one of the tests that characterizes it is a diagnostic test (Ardiansyah et al., 2023). Diagnostic tests are tests that are conducted specifically to identify students' abilities, strengths, and weaknesses so that learning can be designed according to students' abilities and status (Asrijanty, 2020). Diagnostic tests are useful for finding out learning difficulties faced by students including concept misunderstandings (Widoyoko, 2017). Diagnostic tests are conducted by teachers as an initial step in determining the success of students in understanding concepts during the learning process. The results of this test will provide information about concepts that have not been understood by students. Therefore, this test must contain material that students find difficult, but the difficulty level of this test tends to be low (Mardapi, 2008). The function of diagnostic tests is to identify difficulties in understanding the concepts experienced by students and to follow up the problems experienced by students with problem-solving efforts according to the level of misconceptions (Departemen Pendidikan Nasional, 2007).

Efforts to diagnose students' misconceptions require tools in the form of instruments (Diani et al, 2019). Instruments to diagnose students' misconceptions can use diagnostic test instruments (Jumilah & Wasis, 2023). Diagnostic tests can be used to identify students' strengths and weaknesses in the subject matter (Asy'ari, 2023). The results of research conducted on 14 high school physics teachers obtained information that 87% of teachers have never analyzed students' misconceptions on linear motion material. 92% of teachers have never made their own instruments to analyze misconceptions, 90% of teachers have never used diagnostic test instruments to find out the misconceptions of students on linear motion material. The way teachers find out the misconceptions of students on linear motion material is only based on the results of daily tests and approaches. 92% have never made a diagnostic test instrument to identify students' misconceptions.

Diagnostic tests can be either descriptive or multiple-choice. One form of multiple-choice diagnostic test is the four-tier diagnostic test. Using a four-tier diagnostic test instrument according to Istiyono et al. (2022) is an effective way to find out the misconceptions that occur in students. The four-tier diagnostic test is a multiple-choice diagnostic test instrument that has the advantage of identifying and having the ability to reveal the level of confidence of students regarding how much confidence students have in the answers and reasons for the answers given (Sarni et al., 2023). However, the results showed that 95% of teachers had never made a multilevel diagnostic test instrument to identify students' misconceptions. 95% of teachers have never made a four tier diagnostic test instrument to identify

students' misconceptions on linear motion material. Teachers have never made a diagnostic test instrument because 90% of teachers have difficulty making diagnostic test instruments to identify students' misconceptions.

The four-tier diagnostic test instrument is designed to determine how strong learners master concepts through the level of confidence in answering questions. In addition, to find out the extent to which students are able to solve problems and what difficulties students experience when solving these problems, the diagnostic test instrument can be equipped with a *self- diagnosis sheet* (Dendodi et al., 2020). In agreement with Liyu et al. (2020) *self-diagnosis sheets* can be used to help students diagnose conditions in themselves which can be done by providing statement items in the form of sheets that contain answer keys where students diagnose conditions in themselves, especially errors in solving problems based on the answer key provided. Based on the results of the study, it can be seen that 14 high school physics teachers in Lampung province have never developed a *four-tier* diagnostic test instrument equipped with a *self-diagnosis sheet* feature capable of measuring students' misconceptions on linear motion material. A total of 96% of teachers agreed if a *four-tier* diagnostic test instrument was developed with a *self-diagnosis sheet* feature capable of measuring students' misconceptions on linear motion material.

The following is part of the discussion and research findings based on the data analysis found. The results of distributing the questionnaire to 96 student in the lampung province are shown in Table 2.

Table 2. Results of Interpretation of Student's Perception Questionnaire

Question	Percentage	
	Yes	No
Is linear motion material difficult to understand?	82%	18%
Do you have an interest in learning physics?	22%	78%
When learning about linear motion, do you relate it to your daily life?	43%	57%
Has the teacher used learning resources other than textbooks in physics learning? (*E-book,* LKPD, *E-LKPD,* others)	70%	30%
Are you involved in utilizing existing learning resources?	72%	28%
In learning physics, is the test form often used in the form of multiple choice and description?	73%	27%
Have you ever done multiple choice/graded answer questions? (with your reasoning and with a scale of your confidence in answering the question)	10%	90%
Have you ever taken a *four-tier* diagnostic test?	4%	96%
Do you agree with the use of a *four-tier* diagnostic test instrument with a *self-diagnosis sheet* feature?	97%	3%

The results of filling out the questionnaire by 96 high school students in class XI MIPA from several schools in Lampung Province are presented in Table 2. Based on Table 2, 78% of students expressed no interest in learning physics. Learning interest is a factor that affects the success of students in learning physics (Saifullah et al., 2019). Learning interest has an important role in the world of education, with the interest in learning students will have the motivation that underlies students to focus their attention while learning (Sholehah et al., 2018). Learning interests owned by students will cause a sense of liking and attachment to something without any element of compulsion (Muliani et al., 2022). The lack of interest in learning from students in physics lessons also has an impact on the materials studied in physics (Khasana et al., 2023).

One of the physics materials that students must master in the independent curriculum phase F is straight motion. Linear motion is one of the physics topics that is considered difficult. Based on research that has been conducted, it is known that 82% of students consider linear motion n material difficult to understand. Wibowo (2018) found that students find it difficult to understand linear motion material and are less successful when working on problems related to this material because it is based on a lack of student interest in the lesson. If students do not understand linear motion material, it will have an impact on other materials.

Based on the research results listed in Table 2, it can be seen that 43% of students answered that when learning linear motion material the teacher had related it to everyday life. There are 70% of teachers have used learning resources other than package books in physics learning, such as E-books, LKPD, E-LKPD, and others). However, these students are not fully involved in utilizing existing learning resources, only 72% of students are involved and 28% have not been involved in utilizing existing learning resources. According to Samsinar (2019) the use of learning resources will increase learning productivity for both educators and students, motivation and interest in learning, maximum learning completeness because it focuses on individual learning, systematic learning management, and the use and utilization of multimedia in learning. As many as

73% of students consider the test forms that are often used are multiple choice and description. As many as 90% of students have never done multiple choice/multilevel description questions and 96% of students have never done a four-tier diagnostic test. The results showed that 97% of students agreed with the use of a four-tier diagnostic test instrument equipped with a self-diagnosis sheet feature on linear motion material. From several facts and field statements given by teachers and students, researchers want to develop breakthroughs in the use of four-tier diagnostic test instruments equipped with self-diagnosis sheet features on linear motion material that can facilitate teachers and students in identifying misconceptions.

The following is data from interviews with 3 physics teachers, this was done to find out the learning difficulties of students, misconceptions of students, and the use of evaluation instruments in physics learning.

Teacher's opinion regarding students' learning difficulties on linear motion material. In general, based on data collection conducted through questionnaires to respondents, it shows positive results, namely teachers agree to know the learning difficulties of students in learning physics linear motion material, this is reinforced by the following interview data regarding the importance of knowing the learning difficulties of students in learning physics linear motion material, namely:

Teacher 1 as the resource person stated: "In my opinion, it is very important as a teacher to know the difficulties of students in learning physics. In learning physics, students often encounter difficulties in understanding the physics material presented. In physics material for class XI MIPA odd semester or in the independent curriculum called phase F, it is common to find students who have difficulty understanding straight motion material. The difficulty of students in understanding linear motion material is seen when students are less successful when working on questions related to straight motion material. There are many factors that influence students so that this linear motion material is considered difficult by students, but the main factor is due to the low interest in learning students. The learning difficulties of these students not only affect the understanding of the concept of students but also affect the learning outcomes of students. The learning outcomes of students on linear motion material tend to be low and if not overcome will have an impact on other physics materials. Therefore, understanding the concept of linear motion material is very important".

Teacher 2 as a resource person stated: "There are still many students who have difficulty in understanding physics concepts. This can be seen from when teaching and learning activities take place and evaluation or assessment activities. Learners who have difficulty in understanding physics concepts tend to have small test scores. One of the XI MIPA class physics materials is linear motion. There are still many students who have difficulty in understanding the concepts and mathematical calculations, even though linear motion material is the basic material for other motion materials. The difficulty in understanding this material is due to students not paying attention to the teacher when explaining the material and students often sleep in class. So that when asked to re-explain the material that the teacher has delivered, they cannot re-explain. It is very important as a teacher to know the physics learning difficulties experienced by students, because it will be a reference for teachers in overcoming the problem of students' learning difficulties".

Teacher 3 as a resource person stated: "Physics is a subject that is less attractive to students because in physics there are many mathematical equations. The lack of interest in physics lessons also has an impact on the materials studied in physics. One of the physics materials that must be mastered by students is linear motion. Straight motion is one of the physics topics that is considered difficult. Often students find it difficult to understand physics concepts and mathematical calculations. When teaching linear motion material, not a few students complain of difficulty in understanding it. So in my opinion, it is very important as a teacher to know the difficulties of students in learning physics".

Teachers' Opinions on the Importance of Using Misconception Measurement Tools. In general, based on data collection conducted through questionnaires to respondents, it shows positive results, namely teachers agree on the importance of using misconception measurement tools in physics learning, this is reinforced by the following interview data regarding the reasons for the importance of using misconception measurement tools, namely:

Teacher 1 as the resource person stated: "I have never measured the misconceptions that occur in the students I teach. However, it is not uncommon for me to find students who have an understanding of physics concepts that are not in accordance with the actual concept. I often find students in class XI MIPA who experience misconceptions in linear motion material. This can be seen during presentations, when doing homework and learning outcomes that do not reach the KKM. My lack of knowledge about misconception measurement tools is the reason I have never measured misconceptions, even though measuring students' misconceptions is very important, especially in linear motion material, because linear motion material will affect the next material ".

Teacher 2 as the resource person stated:" Misconceptions often occur to students when learning physics. I have measured students' misconceptions on

linear motion material 5 years ago. The misconception instrument I used was a one-tier multiple choice diagnostic test developed by others. For now I have never measured students' misconceptions again, because of the limited study time and the amount of administration that must be fulfilled. So I know the misconceptions of students through learning outcomes and approaches to students. I think it is very important for us as teachers to use misconception measurement tools to find out the misconceptions experienced by students during physics learning".

Teacher 3 as the resource person stated: "Physics is a subject that students are less interested in because it is difficult to understand. I often find students who are sleepy while learning, so that the physics concepts explained by the teacher are not well absorbed by students. I have never measured students' misconceptions, but I often find students who have concepts that are not in accordance with the real concept. I have never made and used a misconception measurement tool on linear motion material. I know students who experience misconceptions only through the results of assignments, the results of practice questions, and the results of daily tests. The low physics learning outcomes are the basis for me in knowing the misconceptions that occur in students".

Teachers' Opinions Regarding the Importance of Using Four-Tier Diagnostic Test Instruments with Self-Diagnosis Sheet in Measuring Learners' Misconceptions. In general, based on data collection conducted through questionnaires to respondents, it shows positive results, namely teachers agree on the importance of using four-tier diagnostic test instruments equipped with self-diagnosis sheet features in measuring students' misconceptions in physics learning, this is reinforced by the following interview data regarding the reasons for the importance of using four-tier diagnostic test instruments equipped with self-diagnosis sheet features, namely:

Teacher 1 as the resource person stated: "So far, the evaluation carried out is only through summative and formative tests, such as PTS, PAT, and daily tests which are sometimes taken from the LKS sometimes also from independent questions that I give, which are usually more analytical and opinion trails. For the four-tier diagnostic test instrument I have never made and used it myself and for the Self-Diagnosis Sheet I have never known it at all. Usually the diagnostic test that I do during the physics learning process is by taking a personal approach, some participants sometimes convey their difficulties and then I respond by trying to uncover the concept of easy material. The informal tests that I do are usually also through homework (homework), to find out the extent of the analysis of students, if the concept of the analysis is not correct and in accordance with what I expect then I need to emphasize and understand again until the concept can be understood by students ".

Teacher 2 as the resource person stated: "I have never created and used a four-tier diagnostic test instrument with a self-diagnosis sheet to identify students' misconceptions. However, I have measured students' misconceptions on linear motion material 5 years ago. The misconception instrument I used was a one-tier multiple-choice diagnostic test developed by others. For now I have never measured students' misconceptions again, because of the limited study time and the amount of administration that must be fulfilled. So I know students' misconceptions through learning outcomes and approaches to students. I have never developed a four-tier diagnostic test with a self-diagnosis sheet feature myself because I find it difficult to develop it."

Teacher 3 as the resource person stated: "I have never made and used a diagnostic test instrument in any form in measuring students' misconceptions in physics learning, including a four-tier diagnostic test instrument with a self- diagnosis sheet feature. I also just found out that there are many forms of diagnostic tests. In diagnosing misconceptions, I only measure through the results of assignments, the results of practice questions, and the results of daily tests. I also find it difficult if I have to include a four-tier diagnostic test instrument with a self-diagnosis sheet ".

Based on the above results, it is known that this is in line with research conducted by Sarni et al. (2023) that what influences teachers to rarely develop and use four-tier diagnostic test instruments to identify misconceptions because teachers find it difficult to make four-tier diagnostic test instruments. Given the importance of teachers' ability to develop four-tier diagnostic test instruments to identify students' misconceptions, it is necessary to hold training activities for the preparation of four-tier diagnostic test instruments.

Conclusion

Based on the results and discussion, the perceptions of 14 physics teachers and 96 high school students in Lampung Province, 87% of teachers have never identified students' misconceptions on linear motion material. 90% of teachers only use the results of daily tests as a benchmark to determine the misconceptions experienced by students. Misconceptions in this linear motion material certainly affect the learning outcomes of students, it is known that only 46% of students reach the KKM on linear motion material. And the results of the questionnaire show that 95% of teachers have never identified the misconceptions of students on linear motion material to make and use any type of multilevel

diagnostic test instrument because the teacher has not had difficulty in making it. Based on the results of the interview, it can be seen that the teacher does not know the four tier diagnostic test instrument with a self-diagnosis sheet. Given the importance of teachers' ability to develop four-tier diagnostic test instruments to identify students' misconceptions, it is necessary to hold training activities for the preparation of four-tier diagnostic test instruments. Therefore, a valid, practical, and effective four-tier diagnostic test instrument with self diagnosis sheet is needed.

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The authors contributed to the preparation and completion of this article. V and UR were responsible for preparing the research instruments and study design. IK played a role in instrument development, data collection, and data analysis of the study.

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Conflicts of Interest
The authors declare no conflicts of interest.

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