

Development Of Live Worksheet-Based Cri Instruments To Detect Student Misconceptions On Straight Line Motion Materials

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Abstract

This research aims are to develop and test the validity of the diagnostic assessment instrument of misconceptions on the motion concept through CRI (Certainty of Response Index) Live Worksheet-based. The test questions were carried out by 23 students of class VIIIB SMP Setiabudhi Semarang. This research instrument uses the Research and Development method of the 4-D development model from Thiagarajan. The validity of this study was carried out using expert validation and item analysis. In the expert validation stage, the question instrument was validated by 3 validators consisting of evaluation experts and material experts with an average proportion of 93.59%. The questions were tested on 20 students, and it was stated that there were 15 questions. The data obtained were analyzed with the help of the Anates application version 4.09. The results showed that: (1) Based on the criteria for the level of difficulty obtained from 1 item (5%), moderate 16 items (80%), difficult 3 items (15%); (2) Based on the question criteria, it was obtained very low 2 items (10%), low 1 item (5%), moderate 10 items (50%), and high 7 items (35%); (3) Based on the reliability test, it was found that the reliability of the test of 0.77 in the high category. Based on the analysis of research data that has been carried out, it can be concluded that the diagnostic test evaluation tool in the form of multiple choice based on the Certainty Response Index (CRI) with predetermined reasons can be used to identify students' misconceptions in straight motion material. The level of misconceptions experienced by grade VIII students of SMP Setiabudhi Semarang consists of the cognitive domains C1-C5. At the level of understanding C1 with 4.4% misconception, C2 28.7%, C3 33.5%, C4 27.1% and C5 6.3%. This research is expected to be a reference or consideration as a form of instrument based on misconceptions on the Straight Motion material through the Live Worksheet-based CRI model.

Keywords: CRI Instruments; Live Worksheets; Misconceptions; Straight Motion; Validity.

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Introduction

Conceptual understanding or understanding the concept of science itself is one of the important indicators for achieving success in learning science (Yulianti & Gunawan, 2019). There is a relationship between understanding concepts and misconceptions, understanding concepts in science learning in the form of mastery of concepts that are in accordance with the agreement of scientists, do not deviate and do not cause other hypotheses that can cause cognitive conflicts (Yuliaty, 2017). Cognitive conflict occurs when students experience discrepancies or discrepancies in their cognitive abilities due to anomaly conditions between experience and scientific concepts (Hidayatullah et al., 2020).

Misconception itself is an error or incompatibility of the concept with the scientific understanding accepted by experts (Rahayu, 2021). The existence of

misconceptions must be a concern for teachers, according to Nurulwati & Rahmadani (2019) this is because misconceptions can have an impact on the success of students in learning science. In the science material itself, physics is a lesson that often makes students misconstrue, especially in the concept of calculation (Rosita et al., 2022). One of the materials that make students wrong concepts is straight motion. The results of the research Oktafia et al. (2019) shows that the misconceptions that occur in one of the straight motion materials reach 60.71%. Furthermore, misconceptions were found in the research of Taufiq et al. (2020) of 47.30% on the same material, namely straight motion.

Straight line motion is one of the important concepts in physics lessons (Dani et al., 2019). In the concept of straight motion, students need to learn the meaning of motion first which is the basis for studying the next physical material, namely the graph of position, velocity, and acceleration (Putri & Afrizon, 2020). The success of students in mastering the material tends to make it easier for students to learn more complex physics concepts (Arianti et al., 2016) therefore the straight motion material was chosen in this study.

Students' misconceptions can be identified with an efficient test, namely by giving a diagnostic test (Hidayah & Muchtar, 2022). Harahap & Novita (2020) stated that a diagnostic test is a test that can be used to detect the weaknesses of students so that based on these weaknesses, appropriate treatment can be given. In this study, misconceptions will be identified based on the confidence level of students by using the Certainty of Response Index (CRI) method. This CRI method was developed to be able to identify the occurrence of misconceptions in students as well as to detect groups of students who do not understand the concept (Putri Hindrasti, 2020). A well-designed research instrument will later be used to identify concepts that become misconceptions for students.

Based on the results of observations made in class VIII SMP Setiabudhi Semarang still distribute assessment instruments to students only through the Whatsapp application. From the observations made, there is a possibility that over time it will cause a sense of saturation. Seeing this phenomenon, researchers feel the need to develop in the use of more interactive learning media or can be referred to as interactive multimedia. Thus, the use of Live Worksheet software is expected to provide a new atmosphere in learning (Kurnianti, 2022). Live Worksheet software is an application that can convert traditional printable instruments (documents, pdf, and jpg) into interactive online exercises because they can contain videos, images, and audio (Sihombing et al., 2022).



Figure 1. Live Worksheet Appearance

The forms of questions that can be made with this application vary widely, such as multiple choice, short answers, choosing true and false, and matching (Prabowo, 2021). This student instrument provides opportunities for students to learn independently (Zulaiha, 2018). To activate and motivate students, the instrument is made online called Live Worksheet with the application "Liveworksheet.com" with a variety of questions.

The problem of this research is whether the CRI instrument used can detect misconceptions? How is the implementation of using Live Worksheets with web-based applications? The purpose of this study was to develop and determine the validity of the CRI instrument based on live worksheet software on the Straight Motion material.

Methods

The type of research used is R&D development research (Research and Development). Furthermore, for the selected development model, the 4D research and development model was adapted by (Thiagarajan, 1974). The 4D research model is divided into 4 main stages, namely: define, design, develop and disseminate. The basic reason researchers use the 4D development model is because this model has systematic stages and is suitable for development research (Amali et al., 2019). The product form of the development that will result from this research is the CRI instrument to identify misconceptions in the Live Worksheet-Based Straight Motion material. The stages in the 4D research model (Solikin & Amalia, 2019) are as follows:

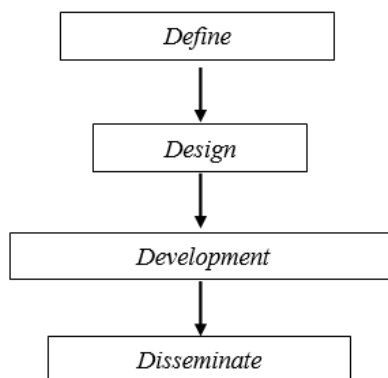


Figure 2. Research Steps

1. Defining Stage

Defining is the stage to determine all forms of requirements needed in the development of learning (Husada et al., 2020). By analyzing basic competencies (KD), learning objectives and limitations of the material to be developed. This is in accordance with the statement from (Bariah, 2019) that a valid instrument is an instrument that is in line with the predetermined learning objectives. After knowing the learning requirements, the results of an analysis of the needs of teachers and students will be obtained that can support the process of identifying misconceptions. At this stage the researcher also determines the product to be developed.

2. Design Stage

Design is one of the stages that aims to prepare Live Worksheets as interactive software for the CRI instrument to be used. Activities that must be carried out at this stage include: Live Worksheet design, test preparation and format selection.

At this design stage, a draft of a Live Worksheet-based instrument will be produced as an application for taking misconceptions detection results using the CRI instrument that has been prepared.

3. Development Stage

Development is the stage that aims to make a draft into a product and test its validity to experts in the field (Masyruhin, 2022). After developing the CRI instrument, the misconception of Straight Motion in accordance with the draft, at the next design stage the products that have been produced are validated to experts, such as: material experts and evaluations to be given advice on the products that have been produced for improvement or revision so that the resulting product is better again. So that at this stage of development, the CRI instrument is produced as an instrument for identifying misconceptions that is worthy to be tested on class VIIIB students of SMP Setiabudhi Semarang with the subject of Straight Movement.

4. Disseminate Stage

Dissemination is the stage that aims to disseminate the results of the products that have been developed in a wider range with the aim of testing the effectiveness of using the results of the products developed (Month, 2019). At this stage, the test instrument was tested on 23 students of class VIIIB SMP Setiabudhi Semarang in August 2022.

The misconception analysis uses the Certainty of Response Index (CRI) analysis. This CRI can measure the misconceptions that occur (Yuniarti et al., 2022) by measuring a person's level of confidence in answering the questions given. The following are the categories of student response beliefs using the certainty of response index in Table 1.

Table 1. Category of Student Response Beliefs using Certainty of Response Index

Scale	Criteria	Certainty
0	Totally guessing	Uncertain
1	Almost guessing	Uncertain
2	Not sure	Uncertain
3	Certain	Certain
4	Almost certain	Certain
5	Certain	Certain

(Afidah & Mariati, 2019)

The identification of misconceptions for respondents can be done based on Table 2.

Table 2. Provisions for misconceptions and for individual respondents

Answer Criteria	Low CRI (<2,5)	Higher CRI (>2,5)
Correct answer	Correct answer but low CRI means don't know the concept (lucky guess)	Correct answer and high CRI means mastering the concept well
Wrong answer	Wrong answer and low CRI means don't know the concept	Wrong answer but high CRI means there is a misconception

Categorization of levels of understanding namely Understanding Concepts (PK), Understanding Concepts but Not Convincing (PKKY), Don't Know Concepts (TTK) and Misconceptions (M) for respondents can be done based on Table 3.

Table 3. Categorization of Level of Understanding

Answer	Reason	CRI Score	Criteria
correct	correct	>2.5	Understanding Concepts well (PK)
correct	correct	<2.5	Understanding the concept but not sure (PPKY)
correct	wrong	>2.5	Misconception (M)
correct	wrong	<2.5	Don't know the concept (TTK)
wrong	correct	>2.5	Misconception (M)
wrong	correct	<2.5	Don't know the concept (TTK)
wrong	wrong	>2.5	Misconception (M)
wrong	wrong	<2.5	Don't know the concept (TTK)

(Kusairi & Zulaikah, 2016)

The item analysis was processed using anates 4.09 software where the use of this software was used to determine the difference power, level of difficulty, validity and reliability of the questions.

DISCUSSION

The research was conducted using an instrument in the form of a three-tier diagnostic test evaluation tool based on the Certainty of Response Index, to identify the misconceptions of class VIII students of SMP Setiabudhi Semarang on the material of straight motion. Before conducting the research, the researcher designed a diagnostic test instrument in the form of multiple choice with a predetermined reason of 20 items. The validation stage in this research is expert validation.

In expert validation, the question instrument is validated by 6 validators consisting of 3 evaluation experts and 3 material experts, each of which is a physicist lecturer and 2 subject teachers. In expert validation, the evaluation criteria for validation instruments are aspects of relevance, ease of understanding, systematics and language which consist of restating a concept, classifying objects to create a concept, developing a concept, applying concepts, using standard and general language (not language). local), the sentences in each question do not cause multiple interpretations, the language used is communicative, the language is easy to understand, the language used is in accordance with the EYD and the instructions for using the test with an average percentage of 95.62%. The results of the evaluation expert validation are presented in Table 4.

In the expert validation of the material, the validation instrument criteria are aspects of relevance, ease of understanding, systematics and language which consist of the suitability of the concepts in each question with the concepts put forward by the experts, the suitability of the content of the material on the items according to the indicators, conformity with students' cognitive development, suitability the content of the material with the purpose of measurement, the references used to make the questions appropriate and adequate, the distractors really work, the content of the material is in accordance with the competence, the use of standard and general language (not the local

language), the sentences in each question do not cause multiple interpretations, the language the language used is easy to understand, the language used is in accordance with the EYD and the instructions for using the test with an average percentage of 91.56%. The results of material expert validation are in Table 5.

Table 4. Evaluation expert validation results

No.	Aspect	Validator			Percentage (%)
		1	2	3	
1	Relevance	78	79	80	98.75
2	Easy to understand	76	75	75	94.16
3	Systematic	78	78	74	95.83
4	Language	74	76	75	93.75
Average					95.62

Table 5. Material expert validation results

No.	Aspect	Validator			Percentage (%)
		1	2	3	
1	Relevance	76	72	72	91.67
2	Easy to understand	74	68	74	90.00
3	Systematic	73	78	74	93.75
4	Language	76	70	72	90.83
Average					91.56

The item analysis was then tested on students to find out the validity of the questions, the differentiating power of the questions, the level of difficulty of the questions, and the reliability of the questions using the Anates 4.09 application. The questions were tested as many as 20 items, of the 20 valid items as many as 15 items. From table 6 it can be seen that in the category of difficulty level criteria, 1 item is very easy in question number 3, the medium category is 16 items, namely at numbers 1, 2, 4, 5, 6, 7, 10, 11, 12, 13, 14, 15, 16, 18, 19 and 20 and the difficult category is 3 items, namely numbers 8.9 and 17. Furthermore, on the criteria for differentiating power, 2 items are very low, namely at items 9 and 13, the low category is 1 item in item number 3, medium category 10 items on items number 4, 5, 6, 7, 8, 10, 11, 12, 16 and 19 and high category 7 items namely on items number 1, 2, 14, 15, 17, 18, and 20. Meanwhile, based on the reliability test, it was found that the reliability of the test was 0.77 in the high category.

Table 6. Recap of Item Analysis Using Anatest 4.09

Original Item Number	Distinguishing Power (%)	Difficulty Level	Correlation	Sign. Correlation
1	40.00	Medium	0.448	Significant
2	60.00	Medium	0.432	Significant
3	10.00	Easy	0.024	-
4	33.33	Medium	0.582	Very Significant
5	30.00	Medium	0.515	Significant
6	33.33	Medium	0.365	-
7	33.33	Medium	0.457	Significant
8	33.33	Difficult	0.641	Very Significant
9	6.67	Difficult	0.205	-
10	23.33	Medium	0.425	Significant
11	33.33	Medium	0.623	Very Significant

12	20.00	Medium	0.252	-
13	3.33	Medium	0.017	-
14	53.33	Medium	0.585	Very Significant
15	56.67	Medium	0.526	Significant
16	33.33	Medium	0.507	Significant
17	40.00	Difficult	0.687	Very Significant
18	40.00	Medium	0.435	Significant
19	30.00	Medium	0.444	Significant
20	40.00	Medium	0.474	Significant

Interactive instruments using electronic media are one of the alternative media that can be used by teachers in carrying out learning activities (Imansari & Sunaryantiningsih, 2017). One of them is the use of the Live Worksheets Application which can be used as an alternative in making interactive instruments (Sumiati & Pratomo, 2021). In this Live Worksheets application there are various features that can be used, you can also attach photos, sounds, and even videos to the instrument so that it becomes more interesting. Through interactive instruments with the Live Worksheets application, students are very happy and motivated to learn (Suwastini et al., 2022)

Soal	Pilihan Jawaban	Pilihan Alasan	Pilihan CRI (Tingkat Keyakinan)				
			0	1	2	3	4
1. Dibawah ini yang merupakan pernyataan yang tepat tentang gerak adalah ...	<input checked="" type="checkbox"/> Gerak suatu benda bersifat mutlak, yaitu tergantung cara memandang benda atau benda yang dijadikan sebagai acuan. <input type="checkbox"/> Gerak benda tersebut memiliki kedudukan yang berubah terhadap benda lain. <input type="checkbox"/> Pengamat yang mengamati benda dapat menjauh ataupun mendekat. <input type="checkbox"/> Pengamat yang mengamati benda yang berada di tempat yang sama sehingga tidak ada perubahan jarak di antara keduanya	<input type="checkbox"/> Jarak benda itu tidak berubah terhadap benda lain <input type="checkbox"/> Kedudukan benda itu jauh terhadap benda lain <input checked="" type="checkbox"/> Kedudukan benda itu berimpit dengan benda lain <input type="checkbox"/> Kedudukan benda itu berubah terhadap titik acuan					√

Figure 3. Sample Category C1

The data shown is an example of question number 1 which is included in category C1 (Restating a concept correctly) which has misconceptions. The correct answer is that the motion of an object has a position that changes with respect to other objects (Answer B), because the position of an object changes with respect to its reference point (Reason D). The above misconception is a complete misconception because the students' answers and reasons are wrong but the level of confidence is 4 (Certain).

3. Kamu berjalan ke timur sejauh 4 m. Kemudian kamu berjalan ke selatan sejauh 2 m dan ke barat sejauh 4 m. Berapakah perpindahanmu?	<input type="checkbox"/> 10 meter ke selatan <input checked="" type="checkbox"/> 10 meter ke utara <input type="checkbox"/> 2 meter ke selatan <input type="checkbox"/> 2 meter ke utara	<input type="checkbox"/> Perpindahan merupakan jarak terpendek dari posisi awal dan posisi akhir suatu benda. <input type="checkbox"/> Perpindahan merupakan angka yang menunjukkan seberapa jauh benda berubah posisi melalui lintasan tertentu <input checked="" type="checkbox"/> Perpindahan adalah total panjang lintasan tempuh suatu benda pada selang waktu tertentu <input type="checkbox"/> Perpindahan adalah besaran skalar yakni besaran yang hanya memiliki nilai dan tidak memiliki arah					√
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Figure 4. Sample Category C2

Question number 3 given to students is an sample of category C2 questions. This question is included in the indicator of understanding the concept where

students present concepts in various forms of mathematical representation. Students are able to estimate the displacement of an object



<p>2. Bumi mengelilingi matahari dengan kelajuan 100.000 km/jam. Saat ini kamu duduk diam dikursimu. Bila titik acuannya adalah kursi yang kamu duduki maka kamu dianggap sedang berada dalam keadaan (1). Bila titik acuannya adalah matahari maka kamu dianggap berada dalam keadaan (2)</p>	<p><input checked="" type="checkbox"/> (1) adalah bergerak sedangkan (2) adalah diam b. (1) adalah diam sedangkan (2) adalah bergerak c. (1) adalah melayang sedangkan (2) adalah bergerak d. (1) adalah diam sedangkan (2) adalah diam</p>	<p><input checked="" type="checkbox"/> Perpindahan adalah perubahan posisi dilihat dari kecepatan benda. b. Perpindahan adalah perubahan posisi dilihat dari titik acuan. c. Perpindahan adalah perubahan posisi dilihat dari percepatan benda. d. Perpindahan adalah perubahan posisi dilihat dari titik berat.</p>	<p>✓</p>
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Figure 5. Sample Category C3

Meanwhile for question number 2 students are asked to determine moving objects and objects that are stationary based on a reference point where this question is included in category C3 because it is included in classifying objects according to certain properties according to the concept.

<p>11. Sebuah mobil bergerak dengan kecepatan yang berubah-ubah seperti digambarkan pada grafik berikut ini</p>  <p>Garis yang menunjukkan mobil sedang mengalami gerak lurus beraturan adalah ...</p>	<p>a. A - B b. B - C <input checked="" type="checkbox"/> c. C - D d. D - A</p>	<p>a. Tidak ada hubungan antara kecepatan dan waktu b. Kecepatan berkurang secara beraturan terhadap waktu <input checked="" type="checkbox"/> c. Kecepatan bertambah secara beraturan terhadap waktu d. Kecepatan dan waktu konstan</p>	<p>✓</p>
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Figure 6. Sample Category C4

In the sample of category C4 questions presented v-t graphs, students are able to analyze GLB graphs correctly. The sample above is an example of students who experience misconceptions. The above misconception is a complete misconception because the students' answers and reasons are wrong but the level of confidence is 4(Certain).





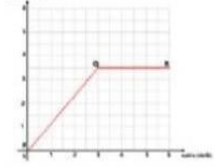
<p>17. Seorang pengamat mencatat gerakan dari sebuah benda. Hasil pengamatan dinyatakan dalam bentuk grafik seperti pada gambar di bawah.</p>	<p>a.  <input checked="" type="checkbox"/> b.  c.  d. </p>	<p>a. Kecepatan awal nol lalu semakin bertambah beraturan b. Kecepatan awal nol lalu bertambah secara beraturan beberapa saat hingga kecepatannya menjadi konstan <input checked="" type="checkbox"/> c. Kecepatan awal nol lalu berkurang secara beraturan beberapa saat hingga kecepatan menjadi bertambah d. Kecepatan awal konstan hingga berubah menjadi semakin besar</p>	<p>✓</p>
 <p>Pola tetesan oli yang sesuai dengan gerak dari benda yang diamati adalah</p>			

Figure 7. Sample Category C5

In category C5 there is only one question, namely number 17, students are able to deduce the pattern of oil droplets that correspond to the motion of objects observed on the graph. The sample above is an sample of students who experience

complete misconceptions because the answers and reasons they choose are wrong but are very sure.

Table 7. Analysis of questions to identify students' misconceptions about straight line motion material

No	Question Number	Question Indicator	Level of Students Comprehension					The number of misconceptions
			C1	C2	C3	C4	C5	
1	1	Describe moving objects correctly	√					9
2	2	Determine moving objects and stationary objects based on a reference point			√			6
3	3	Estimating the displacement of an object		√				3
4	4	Analyzing statements that correspond to straight motion				√		16
5	5	Defining the GLBB statement is decelerated correctly			√			11
6	6	Define GLBB statement			√			13
7	7	Shows GLB pernyataan statement		√				13
8	8	Shows the characteristics of objects that have a constant velocity		√				14
9	9	Interpreting the speed of an object		√				9
10	10	Calculating object speed			√			10
11	11	Analyzing GLB charts charts				√		12
12	12	Analyze acceleration graph				√		10
13	13	Analyze the position chart against time				√		9
14	14	Specifying the GLB grafik graph			√			10
15	15	Adjusting the image with the accelerated GLBB timer ticker pattern			√			9
16	16	Calculate the distance traveled by an object			√			10
17	17	Infer the oil drop pattern that corresponds to the motion of the object					√	13
18	18	Categorize motion types by ticker timer		√				11

19	19	Categorize motion types based on oil drop pattern	√	9
20	20	Analyze fastest time on sensor	√	9

Table 7 shows that from the 20 items consisting of cognitive domains C1-C5 then used and analyzed to identify students' misconceptions. From the identification results, it can be grouped based on categories C1-C5. The percentage of students' misconceptions in each category can be seen in Figure 2. Based on the results of data analysis on the knowledge dimension (C1), students who experience misconceptions are 4.4% which consists of indicators defining the concept of object motion. There are still students who experience the misconception that the motion of objects has absolute properties where the distance of objects does not change to other objects, even though the motion of objects themselves have a changing position with respect to other objects or to their reference points (Emor et al., 2022).

Meanwhile, in the C2 category, 28.7% of students experienced misconceptions which consisted of indicators of calculating distance and displacement. There are still many students who incorrectly answer the calculation of distance and direction of objects. Many students choose reasons that show that displacement is the total length of the path taken by an object while the correct concept is that displacement is the shortest distance from the initial position and final position of an object (Saputra, 2020).

In the C3 category, students experienced the highest misconceptions at 33.5% where the indicator in C3 is to explain the characteristics of a concept, namely the GLB and GLBB concepts. GLB itself is a straight motion which has the characteristics of its trajectory in the form of a straight line with zero acceleration of motion while the speed of motion is constant (Marlupi & Listiyanti, 2020). While GLBB itself has a straight trajectory with a speed that changes regularly (Supriyatna & Roza, 2021).

While the C4 category with indicators determining GLB and GLBB through a graph, students experienced misconceptions of 27.1%. The questions used contain the presentation of a graph to determine which is a uniform straight motion with the right reasons.

This C5 category contains Indicators of applying the GLB and GLBB equations for solving physics problems, there are still many students who experience misconceptions in determining the fastest time that a car travels with a road that has been given a sensor with a misconception of 6.3%.

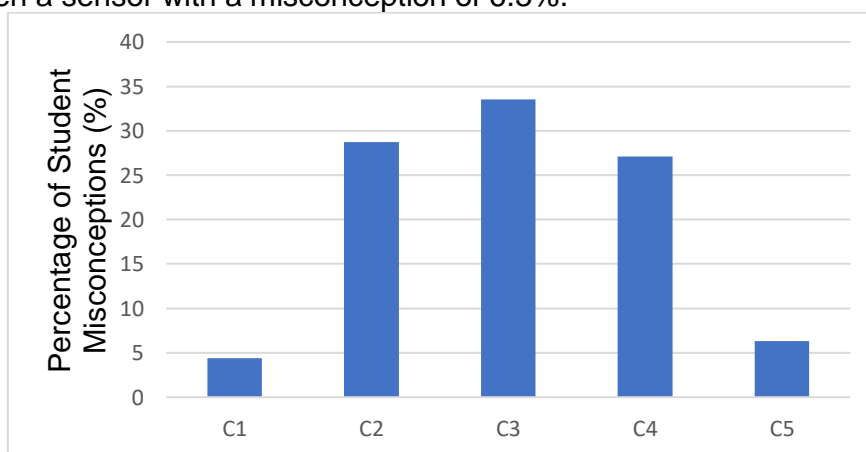


Figure 8. Diagram of the Percentage of Students' Misconceptions

Based on the results of the analysis, the diagnostic test evaluation tool in the form of a three-tier test based on the certainty of response index can identify students' misconceptions on the straight motion material. This is in line with the research of Irwan & Kerans (2022) that the three-tier test instrument can identify misconceptions that occur. Likewise with the research of Nurhayati et al. (2019) which states that misconceptions in straight motion material can be identified using a three-tier test. This study succeeded in developing existing instruments and it was proven that they could be used as a diagnostic evaluation tool for students' misconceptions in straight motion material. Moreover, this study uses interactive instruments that make it easier for students to access it via smartphones that students use.

After students are given learning using the Live Worksheet instrument which contains indicators of ability to understand concepts, then students fill out a response questionnaire that has been made and then analyzed. The student response questionnaire contains 15 questions that contain aspects, benefits, and convenience. Students give positive responses to the presentation aspect because the text is easy to read. For the aspect of the usefulness of obtaining positive response because it has been able to increase learning motivation and curiosity of students, makes it easier to understand the material because it is presented coherently and is related to understanding concepts. Whereas in the aspect of convenience, students gave positive responses because it was easy to access so it was easy to use, the features were usable, and the language used was easy to understand.

The use of the Live Worksheet itself has advantages and disadvantages, the advantages of instruments using this Live Worksheet application are as follows:

1. Save cost in printing.
2. Easily accessible via devices such as mobile phones, laptops, and others.
3. Presented in a more interactive form or format so that students become more interested in doing it.

While the weaknesses are as follows:

1. The process of making the instrument utilizes internet media so that it can allow the data in it to be lost due to system errors.
 2. To be able to access the Instrument must be accompanied by adequate internet.
- (Nirmayani, 2022)

CONCLUSION

At the end of the study, a CRI instrument based on Live Worksheet has been produced to detect students' misconceptions on valid and tested straight motion material that can be implemented. Based on the analysis of research data that has been carried out, it can be concluded that the diagnostic test evaluation tool in the form of multiple choice based on the Certainty Response Index (CRI) with predetermined reasons can be used to identify students' misconceptions in straight motion material. The level of misconceptions experienced by grade VIII students of SMP Setiabudhi Semarang consists of the cognitive domains C1-C5. At the level of understanding C1 with an indicator of the definition of motion of objects experiencing a 4.4% misconception. At the level of understanding C2 misconceptions occur as much as 28.7%. At the level of understanding C3 misconceptions occur the highest as much as 33.5% and at the level of understanding C4 misconceptions occur at 27.1%. Meanwhile, in category C5, the misconceptions experienced are 6.3%. This study recommends the instrument of the question that has been revised and the results of the item analysis state that there are 15 valid questions. Based on the

analysis of the characteristics of the misconceptions that occur in students, it is recommended that remediation be carried out using various learning models, one of which is the ECIRR learning model which uses Phet Simulation media

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