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Misconception Tool: Web-Based Assessment of Buoyancy Materials

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ABSTRAK

Saat ini proses pengukuran dan penilaian yang menggunakan kertas dianggap kurang efektif dan kurang efisien karena relative sulit dalam penskoran, membutuhkan waktu lebih lama dan tentu saja tidak menghemat penggunaan kertas. Oleh sebab itu penilaian berbasis web merupakah suatu pilihan yang lebih baik pada kasus dan kondisi tertentu. Tujuan dari penelitian ini adalah untuk mengembangkan web-based assessment yang digunakan untuk mengidentifikasi miskonsepsi siswa pada materi gaya apung. Penelitian ini merupakan penelitian pengembangan (R&D) menggunakan model ADDIE. Proses pengembangan melibatkan dua orang validator, guru, dan 20 siswa sebagai responden. Pengumpulan data dilakukan menggunakan instrument dan wawancara. Implikasi dalam penelitian ini yaitu untuk dapat melakukan identifikasi terjadinya miskonsepsi yang dialami oleh siswa dengan melibatkan teknologi didalam melakukan penilaian yang dilakukan oleh guru. Data yang didapatkan dianalisis menggunakan statistik descriptive dan analisis Miles dan Huberman. Hasil dari penelitian menunjukkan bahwa dalam penggunaan web-based assessment didapatkan persentase rata-rata mikonsepsi siswa <20% yang termasuk dalam kategori SR (sangat rendah). Respon pengguna terhadap instrument berbasis web ini adalah baik sehingga layak untuk digunakan. Dengan hal ini maka dapat dikatakan bahwa diperlukannya penerapan penilaian berbasis web dalam proses tes dan penilaian disekolah.

ABSTRACT

Currently, the measurement and assessment process that uses paper is considered less effective and less efficient because it is relatively difficult to score, takes longer, and does not save paper. Therefore, web-based assessment is a better choice in some instances and conditions. The purpose of this study was to develop a web-based assessment that will be used to identify students' misconceptions about the buoyant material. This research is development research (R&D) using the ADDIE model, which involved two validators, a teacher, and 20 students, as respondents in the development process. Data collection was carried out using instruments and interviews. The implication in this study is to be able to identify the occurrence of misconceptions experienced by students by involving technology in conducting assessments carried out by teachers. The data obtained were analyzed using descriptive statistics and Miles and Huberman analysis. The study results indicate that in the use of web-based assessment, students get an average percentage of misconceptions <20%, which is included in the SR category (very low). User response to this web-based instrument is good, so it is feasible. With this, it can be said that it is necessary to apply web-based assessment in the process of tests and assessments in schools.

1. INTRODUCTION

At this time, the rapid development of science and technology (IPTEK) will impact various aspects of human life, including in the field of education (Sandra et al., 2021). Physics is one of the natural sciences that has an essential role in improving the quality of human resources, especially in supporting developments in education (Charisma, 2016; Agustyari et al., 2017). With the use of technology in physics, it will be easier to implement it than traditional methods such as lectures, so conventional learning and assessment activities should be complemented by utilizing technology. (Banda & Nzabahimana, 2021; Mbonyiryivuze et al., 2021). The technology that can be used in learning and assessing physics is by using web-based assessment. In physics, the use of technology aims to improve the quality of learning and assessment activities, with the emergence of the term e-assessment. E-assessment is information technology that refers to an electronic assessment process where technology is a means of learning and assessment activities (Sahidu et al., 2017; Astalini et al., 2019). One form of e-assessment is web-based assessment, where the web can be used as a forum to accommodate data information, process data, and provide data results in real-time (Permatasari et al., 2019); (Winda et al., 2021). Web-based

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assessment can be accessed using mobile and laptop. The success obtained from developing this web-based assessment depends on students using this technology (Kayalar, 2016); Liliarti & Kuswanto, 2018). One of the uses of web-based assessment is to measure students' conceptual understanding (misconceptions).

Misconceptions can be measured using technology, namely web-based assessment, where web-based assessment can provide direct data results that can be viewed and can be widely distributed. In addition, the application of web-based assessment provides many advantages; namely, it can reduce the time lag in assessing scores, increase time efficiency, achieve flexibility in terms of time and place and provide direct feedback. (Suyoso et al., 2017; Oz & Ozturan, 2018). Identifying student misconceptions using paper-based tests will take time to correct. If the correction is done manually, it will allow human errors to occur, which can cause errors in assessment or inaccurate identification results (Maiziani, 2016; Purnanto et al., 2018). Seeing the problems that arise from paper-based tests, an alternative in assessment is needed to overcome these problems, one of which is a web-based assessment test. Previous research has a study in a web-based assessment of students at school. Moreover, several previous studies are relevant to research by finding that a web-based four-tier diagnostic test was developed to identify students' high school misconceptions regarding temperature and heat at the junior high school level (Saputri et al., 2021). The results of developing this web-based four-tier diagnostic test can be used to identify students' misconceptions at the junior high school level regarding temperature and heat. Furthermore, research conducted to develop a misconception instrument on business and energy materials in web-based high schools, which is the right solution for teachers to identify students' misconceptions on business and energy materials (Hanum et al., 2021). From the results and the process, this study concludes that this research can produce a misconception instrument on business and energy materials in web-based high schools that make it easier for teachers to identify misconceptions that occur in students.

Further research states that students positively respond to the application of the web as a medium for character assessment in schools (Tanti et al., 2021). By conducting interviews, it is known that students are pretty happy in using the web as a medium for character assessment because by using the web, the results will come out directly so that students can do self-reflection. Further research conducted where the research has been done can be concluded that multimedia influences increasing students' cognitive understanding in the subject of network topology (Cahyana et al., 2021). Almost all respondents who used learning multimedia that had been developed gave a positive response, and the multimedia was declared feasible and could be helpful for students. Furthermore, many misconceptions still occur at the level of understanding of students' concepts in the material of straight motion. It can be said that misconceptions are very vulnerable to occur because students' level of understanding of concepts is still very weak (Putri & Melani, 2021). Several factors can influence a weak understanding of students' concepts. It can result from educators delivering material so that students catch concepts that are different from actual or incorrect scientific concepts.

The existence of a web-based assessment can help teachers reduce the occurrence of conceptual misunderstandings that often occur in students in physics subjects, especially floating style material. This web-based assessment will help students understand abstract physics material and get reinforcement with practice questions that the teacher in web-based assessment has prepared.(Suhendi et al., 2018; Halmuniati et al., 2020). Misconceptions can be overcome by using a web-based assessment where the learning tools designed are devices that meet the valid, practical, and effective criteria and can reduce the level of misconceptions in students—mastery of students' understanding of the concept of buoyancy material. With the technology in the form of web-based assessment, it is expected to be able to provide convenience for teachers in conducting tests and assessments of student misconceptions and provide new experiences for students in conducting misconception tests. The novelty in this research is to conduct a test and assessment of misconceptions using technology assistance in the form of a web-based assessment. With the help of technology in conducting the misconception test and assessing the results of the misconception test, it will provide a new experience for students in conducting tests and for teachers in conducting assessments in the learning process. (Ince, 2018; Wilcox & Lewandowski, 2018). This update is expected to improve the quality of teachers in conducting assessments and improve the results of students' misconceptions on buoyancy material in schools.

The results of this study can be used as a basis for developing learning media and implementing learning media further in the realm of education. Then it can also be an added value to other scientific knowledge in the field of education in Indonesia. The web-based assessment can form innovations for teachers in conducting tests and assessments in the learning process. By utilizing web-based assessment technology, teachers and students can increase their knowledge in using technology. Therefore, the researcher studied the needs of the web-based assessment on how the student's misconception test results on the use of web-based assessment technology. The web-based assessment will accelerate the teacher in identifying the misconceptions experienced by students in the buoyant material. The purpose of this study is to develop web-based assessment technology to identify students' misconceptions and assist teachers in assessing (processing data) the results of students' misconceptions on the buoyant topic in schools.

2. METHOD

This research is a research and development to produce a web-based assessment that can identify students' misconceptions about the buoyant style material. The method used is the explanatory mix method, where this method will prioritize quantitative data, and qualitative data will support the results of quantitative data. The development model used in this research is using the ADDIE model. ADDIE is a process that serves as a framework in the work guide for developing educational products and other learning resources (Branch, 2009). The ADDIE model is a development model that can make products in the education sector more systematic, consisting of analysis, design, development, implementation, and evaluation (Cholid et al., 2016). In the ADDIE model, researchers will develop a product until the implementation stage because the research objectives have been fulfilled until the implementation stage. The product being developed will be subjected to a needs analysis in the first stage. The shape and workings of the product will be designed, which will then be validated at the development stage by an expert validator. After the product is declared valid, the product will be in the implementation stage. At this stage, the product will be implemented with group trials to fill in the four-tier test for buoyancy material.

The instrument used in this study aims to validate the product made and determine students' conceptual understanding of the four-tier-based test included on the website and for needs analysis through interviews and literature studies. Meanwhile, a media expert validation questionnaire was used to validate the product, which contained 35 statements with 5 Likert scales. In contrast, the grid from the media expert validation questionnaire can be seen in Table 1.

Table 1. Media Expert Grid

Variable	Indicator	Items
Functionality	Suitability Accuracy Fulfillment	3, 7, 8, 9; 4, 5, 6; 1, 2
Reliability	Maturity Fault tolerance Recovery	15, 16 ;10, 11, 12; 13, 14
Usability	ability to understand Ability to learn Operation	18, 19, 20, 23; 26, 27; 17, 21, 22, 24, 25
Efficiency	Time Real time Resource	28, 29; 31, 32, 34; 30, 33, 35

(Hanum et al., 2021)

After the expert validation questionnaire is collected, the validator's results for media validation are obtained according to the variables. After that, data was taken from user responses. The grid of the user response can be seen in Table 2.

Table 2. User Response Grid

Sub Variable	Items
Theory	1, 2, 3, 4, 6, 7, 8, 9
Language	5, 10, 11, 12, 18
Display	13, 14, 19, 25, 26, 27, 28
Benefits	20, 21 22, 23, 24

(Pratama & Buditjahjanto, 2016)

After the user response questionnaire was collected, the following data was taken from the four-tier diagnostic test on the buoyant force material with five questions. The grid of the four-tier instrument on the buoyant force material can be seen in Table 3.

Table 3. Grid of Four-Tier Questions on Buoyancy Material

Theory	Question Indicator	Question Form	Question Number
Buoyancy Style	An illustration of a glass filled with water and ice is presented float on the surface of the water to a certain height	Multiple Choice	1

Theory	Question Indicator	Question Form	Question Number
Buoyancy Style	An illustration of two identical ships sailing on is presented Same depth. One of the ships sailing on the river, While other ships sail on the sea	Multiple Choice	2
Buoyancy Style	An illustration of a dam is presented where in the the base is thicker than the rest	Multiple Choice	3
Buoyancy Style	An image of a floating beam is presented below The surface of the liquid in the vessel. Block moved To a place deeper to the middle of the depth of the vessel	Multiple Choice	4
Buoyancy Style	An illustration of three identical blocks with mass and is presented A certain volume floats on the surface of a container that Varied depth.	Multiple Choice	5

(Setiawan & Faoziyah, 2020)

The results of students' answers to the four-tier test questions on the buoyant force material will later be collected data into students who experience misconceptions and students who do not experience misconceptions. The media expert validation questionnaire uses a Likert scale with five scales where a score of 5 is in the very valid category, a score of 4 is in a valid category, a score of 3 is quite valid, a score of 2 is in a less valid category and a score of 1 invalid. The classification of media expert validation can be seen in Table 4.

Table 4. Validation Media Classification

Range	Category
1.00-1.80	Invalid
1.81-2.60	Less Valid
2.61-3.40	Quite Valid
3,41-4,10	Valid
4.11-5.00	Very Valid

(Setiawan & Faoziyah, 2020)

The user response questionnaire uses a Likert scale with four scales where a scale of 4 is in the very good category, a score of 3 is in a good category, a score of 2 is in a bad category, and a score of 1 is a very bad category. The classification of media expert validation can be seen in Table 5.

Table 5. User Response Classification

Range	Category
1.00-1.75	Not very good
1.85-2.50	Not good
2.60-3.25	Good
3.35-4.00	Very good

(Hanum et al., 2021)

The population of this study was students of class XI at SMAN 8 Jambi City, who was to determine the sample to be taken from the population by using the purposive sampling technique. Purposive sampling is a sampling technique to obtain samples according to the research objectives (Mosabala, 2018). The sample criteria chosen were students who had learned about the buoyant force material as many as 20 students who would fill out a user response questionnaire for the product being developed. The two validators in this development are lecturers of physics education at Jambi University, both material and media validators. In the needs analysis, data was collected through interviews; in this interview, the researcher asked about the need for a web-based assessment to identify misconceptions to physics teachers. Furthermore, expert validation is carried out by providing a media expert validation questionnaire where from this questionnaire it will be known the feasibility of the product. After validation, data in the form of student responses will be taken so that students' responses to the developed web-based assessment will be known. Students will fill in misconceptions on the available media to obtain the results of identifying student misconceptions.

The data in this study are quantitative and qualitative data, where later, these two data will be analyzed. Quantitative data derived from expert validation results and product trial results will be analyzed using descriptive statistics. Descriptive statistics are statistics that explain data with explanations in the form of mean, mode, median, percentage, and maximum and minimum values (Tanti et al., 2021). In this study, the results of media expert validation and user responses will be analyzed through the mean. The results of this mean will be adjusted to the assessment classification table according to Table 4 and Table 5. The results of student misconceptions will be analyzed using percentages where students who experience misconceptions and do not experience misconceptions will be compared. The qualitative data in this study comes from interviews, literature studies, and comments from expert validation, where this qualitative data will be analyzed using Miles and Huberman's analysis. Analysis Miles and Huberman will divide the analysis into several stages: collecting data, reducing data, presenting data, and stages of data verification (Ilyas, 2016). Data from interviews and literature studies will be reduced so that it will be able to display the results that are really needed. The author makes the stages of data collection in this study, as shown in Figure 1.

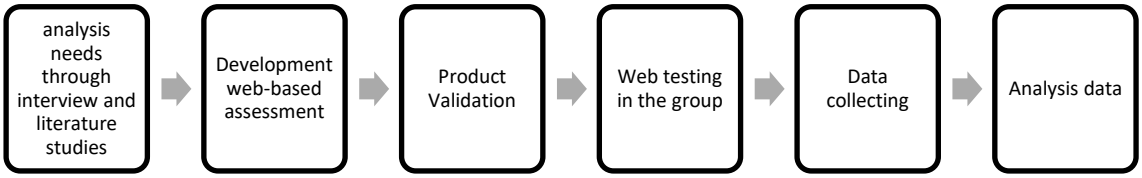

Figure 1. Data Collection Procedure (Sugyono, 2018)

3. RESULT AND DISCUSSION

Result

The needs analysis in this study is to meet the needs of teachers and students. This analysis was conducted using the interview method with a teacher. The results of this needs analysis are used as a reference in making a web-based assessment to support teachers in assessing the level of understanding of students' concepts. The things that were asked in an interview with a teacher were about how the teacher could find out the level of understanding of students' concepts on the buoyant force material, to how the teacher processed the data resulting from the assessment of the level of understanding of students' concepts at school. This is also supported by the previous research, which indicates that the average level of understanding of concepts experienced by students on the work and energy material is categorized as low because the percentage obtained is <30%, which is 24% (Maison et al., 2020). In their research, the researchers measured the level of students' conceptual understanding using a paper-based test. The researcher got the percentage of students' conceptual understanding categorized as low. The results of the descriptive analysis of the media expert validation are in Table 6.

Table 6. Media Expert Validation Test Results

No.	Assessment Aspect	Validator 1			Validator 2		
		Mean	Percentage (%)	Category	Mean	Percentage (%)	Category
1.	Functionality	3.64	72.8%	Good	3.80	76%	Good
2.	Reliability	3.70	74%	Good	3.94	78.8%	Good
3.	Usability	3.73	74.6%	Good	3.75	75%	Good
4.	Efficiency	3.93	78.6%	Good	3.71	74.2%	Good
Overall average		3.75	75%	Good	3.8	76%	Good

In the media expert validation test, the aspects of the assessment of the test results from validator 1 and validator 2. Where obtained values in the aspect of functionality assessment with a mean value are validator (1) 3.64 and validator (2) 3.80, for the percentage, namely validator (1) 72.8% and validator (2) 76%, with the results obtained, the functionality assessment aspect can be categorized as good in its use. Then the value on the reliability assessment aspect with a mean value of validator (1) 3.70 and validator (2) 3.94, for the percentage that is validator (1) 74% and Validator (2) 78.8%, in the aspect of reliability assessment can be categorized as good in its use. Furthermore, in the Usability assessment aspect, the mean value is validator (1) 3.73 and validator (2) 3.75 with a percentage value of validator (1) 74, 6% and Validator (2) 74.2% so that the usability assessment aspect can be categorized as good in its use. In the aspect of efficiency, the mean value of validator (1) is 3.93, and validator (2) is 3.71 with a percentage value of 78.8% and 74.2% and is included in the good category in its use. From the results obtained from validator 1 and validator 2, it can be said that the development of this web-based assessment

is feasible to be used to identify students' misconceptions about the buoyant style material at school. It is supported by the score obtained, namely the average mean of 3.75 with a percentage of 75% (good category) from validator 1 and an average mean of 3.8 with a percentage of 76% (good category) from validator 2. Thus, the development of this web-based assessment is good for identifying misconceptions in students at school on the buoyant force material. After being validated by media experts, the student's responses to the web-based assessment were tested. The data from the descriptive analysis of the student responses can be seen in Table 7.

Table 7. Descriptive Statistics of Student Responses

Interval	Category	Description	Mean	Me	Mo	Max	Min
1.00-1.75	STB	Very Not Good	3.14	3	3	3.8	2.5
1.85-2.50	TB	Not good					
2.60-3.25	B	Good					
3.35-4.00	SB	Very good					

The descriptive statistics table of student responses shows the results obtained from student response statistics. In the student responses, the mean value is 3.14, the mode value is 3.0, the minimum value is 2.5, and the maximum is 3.8; from the results obtained, it can be said that the student's response to the student response test is categorized as good. The percentage level of understanding of students' concepts can be seen in Table 8.

Table 8. Percentage of Student Misconceptions

Question Number	Understanding Presentation		Description Misconception
	Misconception	No Misconception	
1	20%	80%	Fraction
2	5%	95%	Fraction
3	20%	80%	Fraction
4	25%	75%	Fraction
5	15%	85%	Fraction

The results of the misconception test were obtained by giving 5 multiple choice questions to students. With the provision of this question, the result is that question number 1 has a percentage of misconceptions of 20% and no misconceptions of 80%; this can be categorized into a small number of students who do not understand the concept or there are misconceptions. In question number 2, the percentage of misconceptions is 5% and there is no misconception of 95%, this is also included in the category of a small part. Then question number 3 has a percentage of misconceptions of 20% and no misconceptions of 80%, which is included in a small percentage of misconceptions. Furthermore, for question number 4, the percentage of misconceptions is 25%, and there are no misconceptions by 75%. It is also included in a small portion of the occurrence of misconceptions. Continue on question number 5 where the percentage for misconceptions is 15% and not misconceptions 85% are included in a small number of misconceptions. With the results of the misconception test conducted on students, it can be said that it is very unlikely that there will be misconceptions in students in the buoyant force material.

Nis	Kategori					Action
	Soal 1	Soal 2	Soal 3	Soal 4	Soal 5	
100	Kurang Pengetahuan	Positif Palsu	Negatif Palsu	Negatif Palsu	Positif Palsu	delete
101	Miskonsepsi	Negatif Palsu	Miskonsepsi	Positif Palsu	Kurang Pengetahuan	delete
102	Positif Palsu	Kurang Pengetahuan	Negatif Palsu	Negatif Palsu	Miskonsepsi	delete
103	Kurang Pengetahuan	Kurang Pengetahuan	Kurang Pengetahuan	Kurang Pengetahuan	Kurang Pengetahuan	delete
104	Miskonsepsi	Positif Palsu	Miskonsepsi	Kurang Pengetahuan	Positif Palsu	delete
105	Kurang Pengetahuan	Kurang Pengetahuan	Positif Palsu	Miskonsepsi	Kurang Pengetahuan	delete
106	Kurang Pengetahuan	Positif Palsu	Negatif Palsu	Negatif Palsu	Positif Palsu	delete
107	Kurang Pengetahuan	Positif Palsu	Negatif Palsu	Negatif Palsu	Positif Palsu	delete
108	Kurang Pengetahuan	Kurang Pengetahuan	Kurang Pengetahuan	Kurang Pengetahuan	Kurang Pengetahuan	delete
109	Miskonsepsi	Kurang Pengetahuan	Paham Konsep	Negatif Palsu	Kurang Pengetahuan	delete
110	Miskonsepsi	Negatif Palsu	Miskonsepsi	Positif Palsu	Kurang Pengetahuan	delete
111	Positif Palsu	Miskonsepsi	Kurang Pengetahuan	Kurang Pengetahuan	Kurang Pengetahuan	delete
112	Negatif Palsu	Positif Palsu	Kurang Pengetahuan	Miskonsepsi	Paham Konsep	delete
113	Negatif Palsu	Positif Palsu	Kurang Pengetahuan	Miskonsepsi	Paham Konsep	delete
114	Kurang Pengetahuan	Negatif Palsu	Positif Palsu	Kurang Pengetahuan	Miskonsepsi	delete
115	Kurang Pengetahuan	Kurang Pengetahuan	Kurang Pengetahuan	Positif Palsu	Miskonsepsi	delete
116	Paham Konsep	Kurang Pengetahuan	Miskonsepsi	Kurang Pengetahuan	Negatif Palsu	delete
117	Negatif Palsu	Positif Palsu	Kurang Pengetahuan	Miskonsepsi	Paham Konsep	delete
118	Positif Palsu	Negatif Palsu	Kurang Pengetahuan	Miskonsepsi	Kurang Pengetahuan	delete
119	Kurang Pengetahuan	Positif Palsu	Negatif Palsu	Negatif Palsu	Positif Palsu	delete

Figure 2. Misconception Test Results using Web-Based Assessment

It can be seen in Figure 2 that it is the result of the answers of students who have filled out the questions in the form of four-tier, which amounted to 5 items in the form of multiple choice. The students' answers are misconceptions, lack of knowledge, false positives, and false negatives. These results are obtained from the student test results page contained in the web-based assessment.

Discussion

The development of a web-based assessment on this buoyant style material indirectly makes one of the solutions to problems in identifying the level of understanding of students' concepts at school. Web-based performance assessment is an appropriate assessment technique in identifying the level of understanding of students' concepts (Wahyuni & Susanto, 2018; Wang, 2018; Supianto et al., 2020). The thing that supports the development of this web-based assessment is by conducting a needs analysis by conducting interviews with teachers at schools; this is done to find out the problems that occur and provide solutions for teachers in solving them. The results of this need analysis show that developing a web-based assessment to assess misconceptions on the buoyant force material is necessary because it makes assessment and identification easier. Before this web-based assessment is used by the teacher in identifying students' misconceptions, this web-based assessment needs to be validated, where validation is carried out on the developed media. (Wardathi & Pradipta, 2019; Fallensky et al., 2021; Widiyana et al., 2021). After validating the web-based assessment, it is known that this web-based assessment is suitable for teachers to identify students' misconceptions about the buoyant style material.

Then from the results of web-based assessment development, it can be seen that using web-based assessment in identifying students' misconceptions on buoyant material can assist teachers in identifying misconceptions that occur in students at school. The web-based assessment can help teachers reduce or reduce misunderstanding of concepts in students at school (Upayogi & Juliawan, 2019; Sahidu et al., 2017). Developing student conception assessment using web-based assessment has the advantage; for example, conducting tests can be done anywhere and anytime. It can provide direct feedback with data results that automatically come out after the test by shortening the teacher's time to process data in real-time and with accurate results (Wahyuningsih et al., 2016; Rahman et al., 2021).

Using this web-based assessment makes it easier for researchers to conduct an assessment to identify the effect of self-assessment on students (Ishmael 2020). As for other related research, namely, research where in research, web-based assessment is used to measure the problem-solving skills of individual students by using interactive web-based assessment in the webcps program. In this study, the web-based assessment was used as a technology to assess the problem-solving skills of individual students (Azura et al., 2021). As for further research related to the research, Web-based assessment is used to increase effectiveness and efficiency in recording teacher assessments and database management systems to store student assessments for a longer period so that data can be retrieved quickly and data processing is more organized (Nuka & Daniel, 2021). With this web-based assessment, teachers as education personnel will be helped because they can perform assessments automatically and save the data for long-term data.

In developing a web-based assessment to identify these misconceptions, there is a novelty in this research. This study will examine a web-based assessment that can identify misconceptions in floating style material with a five-tier format and measure the reduction of students' misconceptions. The use of web-based assessment will make it easier for teachers to identify, reduce, and assess students' level of understanding of students' concepts in real-time and broadly (Kusairi et al., 2017). Furthermore, no research has developed a web-based assessment to identify and reduce students' misconceptions about buoyancy material in schools. In developing this instrument in a four-tier format, the researcher used a paper-based test to identify students' misconceptions at school. So it takes technology in the form of a web-based assessment to identify students' misconceptions about the buoyant style material at school. The implications of developing a web-based assessment to identify and reduce misconceptions that occur in students at school can be seen where the technology in this web-based assessment can make it easier for teachers to identify misconceptions that occur in students. This web-based assessment can reduce students who experience misconceptions in the buoyant style. By using this web-based assessment, it can save more paper then, streamline time and make it easier for teachers to process the results of student misconception answers, and the data already contained in this web-based assessment can be stored automatically and can be used as archives for Long-term assessment in the assessment process in schools.

The advantage of this web-based assessment development research is that this research can be a benchmark or reference for other research that is also developing technology in the same realm, namely in education. The existence of web-based assessment is a good contribution in conducting misconception tests and assessments carried out by teachers in schools; this is supported by the results of the misconception test obtained by students who are categorized as experiencing low misconceptions. The limitations of this study are that this research only comes to identifying students' misconceptions and the development of this web-based assessment is only on buoyant force material, while what we know is that there are many other physics materials found in schools. Furthermore, for recommendations for further research, the development of a web-based assessment is

only limited to identifying and reducing the occurrence of misconceptions experienced by students in the buoyant style material at school. We already know that the physics material in education is comprehensive, so it is not only limited to buoyant force material. Developing other web-based assessments can identify and reduce students' misconceptions in other physics materials is possible.

4. CONCLUSION

By using web-based assessment, students as users show good response in the application of web-based assessment as a medium for testing misconceptions and assessing misconceptions test results in schools. Through interviews, it is known that students are quite interactive in using web-based assessment as media for assessing misconceptions because they can show results directly and can immediately carry out evaluations. With this, it can be seen that the use of tests and assessments based on web-based assessments must be applied in the testing and assessment process in schools.

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