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RESEARCH ARTICLE

VALIDITY OF STUDENT WORKSHEETSWITH THE THEME OF ENERGY IN DAILY LIFE BY PROBLEM BASED LEARNING OF INTEGRATED IN 21ST CENTURY LEARNING

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Abstract

Integrated student worksheets should contain learning that is relevant to the characteristics of 21st century learning. Where 21st century learning aims to develop the talents and potential of students so that students have characters and attitudes that will be able to face the challenges of 21st century learning. To use this integrated student worksheets, an assessment was carried out in the form of validation of the development of this this integrated student worksheets. The purpose of this assessment is to see the validity of the development of this integrated student worksheets with the theme of energy in life using integrated problem-based learning in 21st century learning. This validation assessment is carried out by three validators consisting of material experts, media experts and linguists.

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Introduction:-

Education is a process in learning that aims to achieve the goals of national education. The goals of national education will not be achieved without the efforts and efforts made by the teacher during the learning process. In formal education such as Junior High School, it is one of the education providers that cannot be separated from the objectives of national education itself. This is because the goal of national education is one of the benchmarks for success in facing the challenges of the 21st century. This 21st century education aims to realize the aspirations of the Indonesian nation to become a nation that is respectable and equal to other nations in the global world. Through learning, it is hoped that students will be able to master various fields of life sciences, students so they can have good public speaking skills. Because the purpose of 21st century learning is to encourage students to be able to master various skills that are in accordance with the demands of the 21st century. Where 21st century learning emphasizes four skills, namely communication skills, collaboration, critical thinking and creativity (Weri, 2019).

The 21st century education paradigm is certainly in line with the demands of the 2013 curriculum which demands that all subjects must contribute to the formation of attitudes, knowledge and skills for students. So that in learning, students do not only have attitudinal abilities, but also refer to knowledge such as critical thinking, collaboration, creative thinking and communication. One of the subjects that refers to the 2013 Curriculum and plays an important role in facing the challenges of the 21st century is natural science. Science is a branch of science that consists of physics, chemistry and biology. During the learning process using the 2013 Curriculum, science learning emphasizes student-centered learning. This aims to maximize students so that they are actively able to develop all the potential that exists in themselves and build their own knowledge by giving problems from various phenomena

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that exist in their environment. In this way, the teacher can direct students to develop and solve the various problems they find.

One of the learning models in the classroom that is in accordance with the above is problem based learning (PBL). PBL is aimed at training students to think critically to solve problems faced in everyday life (Nurlaila, 2013). Through the learning process using this model, it is hoped that classroom learning will be more effective and efficient. To support the feasibility of using the learning model, teachers certainly have learning resources that can help students to take an active role during the learning process. One of the learning resources used by the teacher in the learning process is the student worksheet. Student worksheets is one of the means used to assist and facilitate students in the learning process. Thus, by using integrated student worksheets, learning objectives that refer to student-centered can be achieved optimally. Therefore, it is necessary to develop an integrated student worksheets in accordance with the demands of the 2013 curriculum and 21st century learning.

In order to be used in the learning process, of course this integrated student worksheets must be done first. Validity is a measure to indicate the level of validity or validity of an instrument. Validity also describes the extent to which a measuring instrument is able to measure what is being measured (Hendryadi, 2017), in this case the integrated student worksheets. In the development of integrated student worksheets, there are at least four types of validity, namely the feasibility of content, construction, language and graphic. Validation is carried out to see the suitability of the integrated student worksheets developed with the curriculum, such as the suitability between basic competencies and competencies, the truth of science that is up to date, valid and accurate, conformity in everyday life and uses a model that is in accordance with the 2013 curriculum. Then construct validation arranged to determine the extent of regularity in the preparation of this integrated student worksheets and the suitability between the illustrations and the material provided. Furthermore, linguistic validation is prepared with the aim of the language given according to the age development of students and also the suitability of language with physics, so that students will not experience loss of communication while learning. And the last one is graphic validation, where this validation aims to describe the preparation of integrated student worksheets, whether this integrated student worksheets has used the appropriate type and size of letters or is the illustration of the image and design interesting or not. Based on the description above, validation of the development of integrated science student worksheets is carried out with the theme of energy in life using integrated problem-based learning in 21st century learning.

Method:-

This research is a descriptive study, where this descriptive study aims to describe and present a variety of information studied. The instrument used in this study was a questionnaire and analyzed using a Likert scale. The steps of this validity analysis are as follows

1. Give a score for each answer item, where the answer strongly agrees to get a value of 4, the answer agrees to get a value of 3, the answer does not agree to get a value of 2 and the answer strongly disagrees with a value of 1.
2. Add up the total score of each validator for all indicators.
3. Provide validity values using the Aiken's V formula (Aiken, 1985, p. 133), namely:

$$v = \frac{\sum S}{[m(c - 1)]}$$

$$s = r - l_0$$

r : Number given by the validator

l_0 : The lowest number of validity assessments

c : The highest number of validity assessments

The validity category of the developed integrated student worksheets can be seen in Table 1.

Table 1:- Validity Categories of Integrated Student Worksheets.




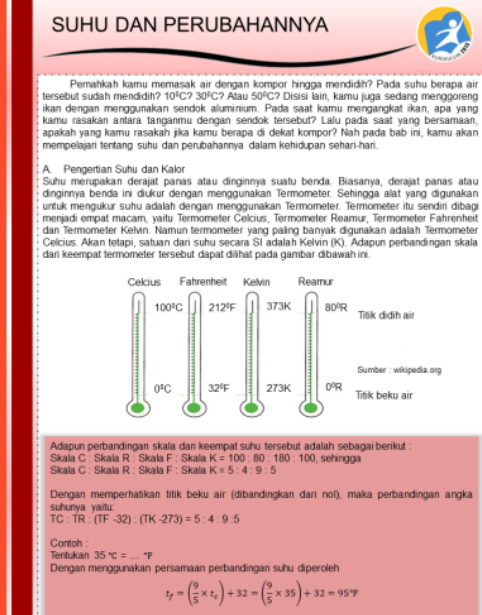
No.	Category	Percentage of Achievement Indicators
1	Invalid	$0.0 \leq v \leq 0.66$
2	Valid	$0.67 \leq v \leq 1.00$

Based on Table 1, it can be seen that if the data is categorized as valid, the validity interval is at the interval, while the data is ≥ 0.67 said invalid if the validity interval is in the interval ≤ 0.66 .

Results and Discussion:-

The assessment was carried out by three validators consisting of material experts, media experts and linguists. This assessment resulted in valid criteria for the four components of this integrated student worksheets. This integrated student worksheets validation consists of the feasibility of content, construction, language and graphics. In doing this validation, there are also some inputs provided by the validator as a refinement of the development of integrated student worksheets with the theme of energy in life using the problem-based learning model of integrated 21st century learning. The comparison of integrated student worksheets before and after being revised by the validator can be seen in Table 2.

Table 2:- Results of the Revised Integrated Student Worksheets Expert Review.

No.	Before the Revision	After the Revision
1	 <p>Before the revision, the images on the cover did not match the layout order.</p>	 <p>After being revised, the images on the cover are in accordance with the layout order and the use of colors on the cover is not too flashy.</p>
2		

	Before the revision, it had not used standard fonts and sizes. This section uses a typefaceBerlin Sans FB size 14.	After the revision, it used the standard font and size. This section uses a typefaceArial size 12.
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After several revisions were made to this integrated student worksheets, then an assessment was carried out on this integrated student worksheets. The assessment conducted by three validators resulted in valid criteria for the four components of the integrated student worksheets. The results of the integrated student worksheetsvalidation can be seen in Table 3.

Table 3:- Results of the Integrated Student WorksheetsValidity Assessment.

No.	Validity Components	Score	Criteria
1	Feasibility of Content	0.87	Valid
2	Construct	0.83	Valid
3	Language	0.85	Valid
4	Graphics	0.88	Valid
Average		0.86	Valid

Table 3 can be seen that the integrated student worksheets is already in the valid category in terms of the content, construct, linguistic and graphic feasibility components with an average value of reaching. This is in line with the opinion of experts who say that a teaching material is said to be valid if it is at an interval $\geq 0,61$ (Hidayat, 2020). For more details, the results of the above validity assessment can be seen in Figure 1 below.

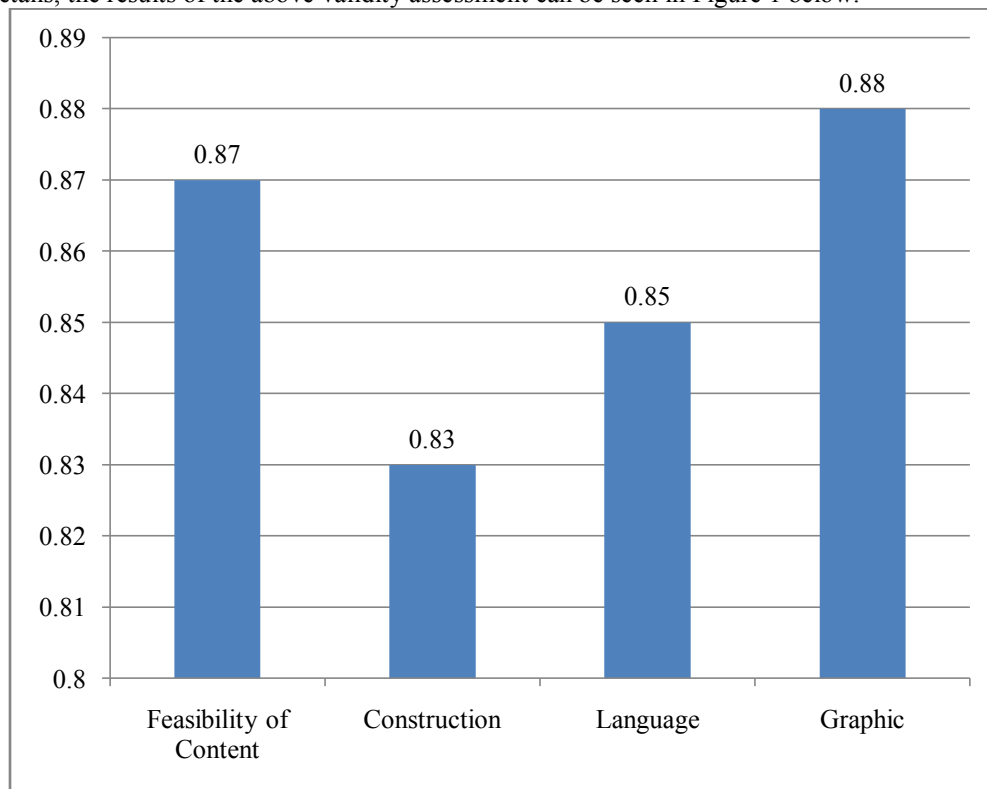


Figure 1:- Validity Assessment Results

Based on the figure, it can be seen that of the four components the highest validity is in content feasibility. The feasibility of this content aims to ascertain whether the contents of the integrated student worksheetsare relevant to the objectives of the development of the integrated student worksheetsitself. Based on this, the integrated student worksheets that was developed has illustrated that the integrated student worksheetsis in accordance with the demands of the Core Curriculum, Basic Competencies and formulated indicators. In addition, the integrated student

worksheets has also presented information in accordance with scientific truth and the depth of the material and has included it according to the problem-based learning model.

Conclusion:-

Based on the description described above, it can be concluded that the validation that has been carried out has met the criteria for the preparation of good and correct teaching materials. In other words, that the integrated student worksheets that has been validated has met the validity components which include the feasibility of content, construction, language and graphic. Thus, in the development of integrated student worksheets with the theme of energy in life using an integrated problem-based learning model in 21st century learning, it can be tested in the learning process in schools.

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