

Work Sheet Oriented Multiple Intelligences Validity on Biology Topics for Student Class XI

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Abstract –During the learning process, teachers are already using the Student Worksheet. Student worksheets used by teachers have some drawbacks such as the picture presented is not clear and has a color that is not attractive. In addition, the learning process still involves an explanation of the teacher, so that the student worksheets that have been designed not applicable because of time constraints. In the end, students are not able to develop intelligence that is in that will affect student learning outcomes. To address this problem, the developed students Worksheet Oriented Multiple Intelligences. The purpose of this research is to develop students' worksheets Oriented *Multiple Intelligences* and to determine the validity criteria. This type of research is the development of by using Plomp models. Plomp development model consists of three stages of development, namely: the initial investigation phase, the phase of the development and prototyping phase and the assessment phase. Data collection instruments used was the instruments validity of students' worksheets. Oriented student worksheets *Multiple Intelligences* validated by 3 experts and 1 teacher. The results showed that the aspect of content, presentation and language obtained a score of 86.67%, 84.37% and 82.14% to the category of very valid, while the graphic aspect obtained a score of 78.57% with a valid category. It can be concluded that student worksheets oriented *Multiple Intelligences* obtain very valid category. So it can use during the learning process and it expected to improve student learning outcomes.

Keywords – *Student Worksheet; Multiple Intelligences; Validity.*

I. INTRODUCTION

In 2013 all curriculum subjects should contribute to the formation of attitudes, skills and knowledge. So that students are required to actively and optimize the intelligence and talent in each subject.

One of the subjects that no education level, especially in high school was biology. Biology is one of the subjects relating to living beings. Biological materials typically have the characteristics of the facts, concepts, images that are

abstract and their Latin names are hard to remember. Based on the results of interviews conducted with teachers in schools in the field, it is known that the material is difficult by the students is the material associated with the system in the human body. Students have difficulty in demonstrating the organ composer and explain the mechanisms involved in each system in the body. This is consistent with the results of interviews conducted on the students that the material system of the human body is a material that is difficult to learn.

Difficulty learning the material will affect student learning outcomes. In addition to learning the results obtained by students is also influenced by the intelligence. Everyone has a different intelligence. Differences potential intelligence of every person is called *multiple intelligences*. In accordance with that raised by Gardner (2011: xii) categorizing intellect to 8 include linguistic intelligence, logical mathematical, spatial, bodily kinesthetic, musical, interpersonal, intrapersonal, and naturalist. Armstrong (2015: 15-16) states that every person has the eighth this intelligence. This intelligence eighth functions together and in a unique way. Gardner suggests that almost everyone has the ability to develop intelligence eighth to a high enough level of performance if given the right encouragement, enrichment, and precise instructions. Various types of intelligence does not operate alone, but can be used at the same time and tend to be complementary to each other when someone solve a problem, as well as in the learning process.

Therefore it takes strategy and teaching materials that can make students get involved physically and psychologically for learning more meaningful and can develop a variety of potential intelligence that is in the students. So it can improve student learning outcomes both in the cognitive, affective and psychomotor (Asrizal et al., 2014). One of the teaching materials that can facilitate students to develop a range of intelligences that exist on students and are usually used in learning is students' worksheets. Student worksheet is printed instructional materials containing materials, summaries, and directives implementation of the tasks to be done by the students, which refers to the basic competence, is achieved. Student worksheet serves as a guide student learning and also allows students and teachers to conduct classes (Prastowo, 2011: 204).

Based on observations and interviews conducted from April to May 2017 in SMA 1 Padang, Padang SMA 3 and SMA 12 Padang), it is known that during the course the teachers are already using students' worksheets. Student worksheets used at each school during the learning is student worksheets designed by the teacher. The results of our analysis of the student worksheet used, it was shown that the student worksheet given to students in the form of photocopies so that the picture presented is not clear and has a color that is not attractive. Worksheets students also do not have a description of the material, so that students have difficulty in understanding learning. In addition, the learning process still involves an explanation of the teacher, so there is some student worksheets cannot be applied because of limited time for learning and students the opportunity to conduct discussions very rare.

In the application of the theory of *multiple intelligences*, sekolah should recognize and respond to a variety of intelligence of students and allow students more space to develop its intelligence (Leonardo, 2015: 35-36). Therefore, teachers need to pay attention to all the intelligence, not only linguistic and mathematical intelligence that has become their traditional concern but also other intelligence (Goronga, et al., 2014: 14-15).

In order for the student developed a worksheet fit for use, the first, student worksheets that must divalidisi. According Subiyanto (1993: 109) the validity means something acceptable or valid which is in accordance with the truth that is expected to be received within a certain criteria. Meanwhile, according Arikunto (2012: 82-83), a data generated from a product is said to be valid, it can be said that the product provides an overview of the development goals correctly and in accordance with reality and real state.

Based on the experiences to the above, then do researches on the validity of student worksheets orient *multiple intelligences* biological materials for XISMA grade students.

II. LITERATURE

A. VALIDITY

Validity is defined as the extent to which an instrument measures what is intended to be measured. Validity requires reliable instruments (Kimberlin and Winterstein, 2008: 2278). Messick (1989) defines validity as an integrated evaluative judgments extent of empirical evidence and theoretical reasons support the adequacy and appropriateness of the conclusions and actions based on test scores or measurements.

The validity of the English language is derived from the word *validity* that means the legality or correctness. In the context of measuring instruments or the assessment instrument, validity means the extent to which the precision or accuracy of the measuring instrument in performing measuring function. Testing validity can be done by several methods. Components validity according to Ministry of Education (2008: 28) regarding the development of teaching materials in general "criteria assessed by experts include the contents of the components, the components of language, presentation components, and graphics components". Contents component test is a test for the validity of content or materials of a resource. In accordance proposed by the Ministry of Education (2008: 28) states that "component content includes: compliance with KI, KD, compliance with child development, compliance with the requirement of teaching materials, the truth of the material substance of

learning, the benefits for additional insight, compliance with moral values, and social values ". The Education Ministry statement shows that the validity of a teaching material as seen from the content of the material or the content must be in accordance with some analysis such as the analysis of Core Competence and Basic Competence, of necessity, the truth of the substance, the benefits, moral and social values.

Components include the following language, readability, clarity of information, Compliance with the rules of Indonesian is good and right and Utilization of languages effectively and efficiently (clear and concise). The presentation components include the following: Clarity of objectives (indicators) to be achieved, a grain Order, granting motivation, attraction, interaction (stimulus and respond), Completeness of information. While the graphics components include the following: The use of the font; types and sizes, Lay out or layout, illustrations, drawings, photographs, and Design view.

B. STUDENT ACTIVITY SHEET

Student activity sheets are sheets contain tasks that must be done by the students. Sheets are typically in the form instructions, the steps to complete a task. The advantage is the activity sheets for teachers, allowing teachers in implementing the learning, the students will study independently and learn to understand and execute a written assignment (Daparteman National Education, 2008: 23).

C. MULTIPLE INTELLIGENCES

theory of *multiple intelligences* developed by Howard Gardner, a professor of developmental psychology and education at the *Graduate School of Education*, Harvard University, USA. Intelligence by Gardner (2011: 63) is an ability to solve problems that allow individuals to resolve these problems and produce a product. Gardner argued that the existence of a number of different intelligences, each of which develops in the individual. Gardner initially found seven types of intelligence but later expanding it to eight, and discussed the possibility of intelligence to nine.

The concept of *multiple intelligences* is to develop the intelligence needed to lead a successful life (Goronga, et al., 2014: 14-15). In the application of the theory of *multiple intelligences* is, schools should recognize and respond to a variety of intelligence of its students (Leonardo, 2015: 35-36). In the study, the student has a different intelligence, Some students are visual, while others are kinesthetic, but there is a combination of all of the intelligence (McFaarlane 2011:). Kezar (2001: 152-154) demonstrated that through multiple intelligences, we can respond effectively to the

increased access to education and teaching and learning, meeting the diverse needs of technology users to develop multiple intelligences.

III.METHODS

This type of research is the development of *using* models Plomp. Plomp development model consists of three stages of development, namely: the initial investigation phase, the phase of the development and prototyping phase and the assessment phase. Data collection instruments used were sheets of validation to measure the feasibility / validity of the products developed. Validation oriented student worksheets multiple intelligences was conducted by three (3) persons in accordance with its team of experts and study each and 1 teacher. The test results are then used for the revision of student worksheets that really meet the needs of the user. The following expert validation of instruments used:

IV.VALIDATION SHEET STUDENT WORK SHEET ORIENTED MULTIPLE INTELLIGENCES

A. ASPECTS OF CONTENTS

No	Aspect Assessed	Penilaian			
		1	2	3	4
		STS	TS	S	SS
1	student worksheets prepared in accordance with core competencies contained in the Curriculum 2013.				
2.	Worksheets students are prepared in accordance with the basic competencies contained in the Curriculum 2013.				
3.	Worksheets students prepared in accordance with the development of students.				
4. The	Student worksheet prepared in accordance with the needs of students.				
5.	Worksheet prepared students can develop multiple intelligences of students.				
6.	Images contained on worksheets students can develop students' visual intelligence.				

7.	The problems inherent in the student worksheet can develop logical intelligence, linguistics, and naturalist students.				
8.	Sheet student discussion contained in the student worksheet can develop interpersonal intelligence, intrapersonal and kinesthetic students.				
9.	Truth contents of learning materials on student worksheets can be justified.				
10.	Students prepared worksheets able to broaden students.				

B. ASPECT LANGUAGE

No	Aspect Assessed	Penilaian			
		1	2	3	4
		STS	TS	S	SS
1.	DESCRIPTION materi contained on student worksheets easily understood.				
2.	The language used in accordance with the rules of Indonesian true.				
3.	Student worksheets do not use sentences that give rise to a double interpretation / ambiguous.				
4.	The language used in accordance with the level of student understanding.				

C. ASPECTS OF PRESENTATION

No.	Aspect Assessed	Penilaian			
		1	2	3	4
		STS	TS	S	SS
1.	Cover student worksheet has a clear identity.				
2.	The spreadsheet contains student learning objectives that wish to achieve				

3.	Order of the grain in student worksheets systematically arranged.				
4.	The problems presented in the worksheet students are able to motivate students to learn.				
5.	Student's worksheet contains questions that can enhance students' critical thinking skills to the material being studied.				
6.	Student worksheet contains questions that can develop multiple intelligences of students.				
7.	Questions are presented in the worksheet students are able to activate students in learning.				

D. ASPECTS OF GRAPHIC

No.	Aspect Assessed	Penilaian			
		1	2	3	4
		STS	TS	S	SS
1.	The font used was appropriate.				
2.	Size of the letters used is proportional.				
3.	The layout of the content in interesting students' worksheets.				
4.	Images contained in the student worksheet are right.				
5.	Images contained in the student's worksheet clearly.				
6.	The use of color in students' worksheets is correct.				
7.	Design view overall student worksheets interesting.				

The data collected from this study is the validation results-oriented student worksheets *Multiple Intelligences*.

Data in the form of student eligibility worksheet 1-4 Likert scale with the following provisions:

- Strongly Agree (SS) with a weight of 4
- Agree (S) and weighs 3
- Disagree (TS) with a weight of 2
- Strongly Disagree (STS) with a weight of 1

Furthermore, the results of scoring percentages were tabulated and searched using the formula:

$$\text{value validity} = \frac{\text{Scores obtained}}{\text{Maximum score}} \times 100\%$$

Based on the validity of the values obtained, it was determined criteria for assessment of the validity of the student worksheets *Multiple-oriented Intelligences* with provisions such as in Table 1.

Table 1. Criteria for Determination the level of validity

ranges%	Category
0-20	Very Invalid
21-40	Invalid
41-60	Enough Valid
61-80	Valid
81-100	Very Valid

(Riduwan 2009: 89)

Validation on aspects of content, language, presentation and garfish conducted by experts / specialists and teachers can be seen in Figure 1.

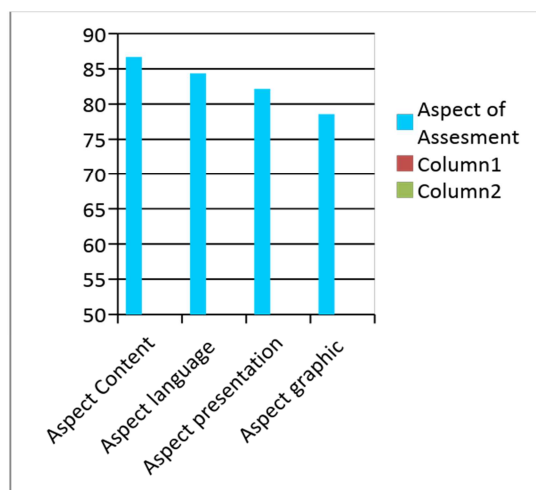


Figure 1. Validation Results Worksheets students by experts and teachers.

V. DISCUSSION

The validity of student worksheets oriented *multiple intelligences* rated by experts / specialists. Aspects assessed validity consists of four aspects: content, language, presentation and graphics. Validator involved in this validation process is Dr. Darmansyah, ST, M. Pd as a technology expert, Mr. Dr.Abdurrahman, M.Pd as a linguist, Dr. Ramadan Sumarmin, M.Si as subject matter experts. Dra. Azhira, M.Pd as validator matter of SMA 3 Padang. Validity assessment done by the overall gain value with very valid category.

Assessment of the feasibility aspect of student worksheets obtained very valid. Category very valid obtained from expert judgment due to student worksheets are developed in accordance with KI, KD contained in Curriculum 2013. Additionally developed student worksheets tailored to the development, and the needs of multiple intelligences (*Multiple Intelligences*) students making it easier for students understand learning. This is in accordance with the opinions raised by Hamzah (2009: 260) states that the multiple intelligences influence on learning orientation. Students can easily understand the lesson if the material is presented in accordance with intelligence possessed.

The second assessment is the aspect of language. Aspects of language on a worksheet students gain value with very valid category. This is because the language used on a worksheet students in accordance with the correct spelling of Indonesian, although in some parts there are errors in punctuation, sorting words still less precise and error in typing. Besides student worksheet that is designed not use the phrase that poses a double interpretation. Description of the material contained in the student worksheets are also easy to understand and in accordance with the level of student understanding (Asrizal et al., 2014).

A further aspect is the aspect of the presentation. Aspects presenting obtain very valid values by category. This is because the student worksheet that is designed to have a clear identity has the learning objectives to be achieved, the order of the material systematically arranged. In addition, student worksheets are also equipped with questions that can improve the ability to think critically, develop multiple intelligences and activate students during learning. This is in accordance with the opinion Trianto (2011: 212), student worksheets can enable students in learning activities, helping students find and develop the concept, to train students to find a concept, an alternative way of presenting the subject matter which emphasizes the students' activity, and can motivate students.

The final aspect is the graphic aspect. Graphic aspect scored with a valid category. This is because the use of the type and size of letters on student worksheets are correct. Student worksheet has an interesting layout of the content. Besides student worksheets completed with pictures, although there are still some errors contained in the crate image size is too large. The use of color and design at attractive student worksheet. This is in accordance with the opinion expressed by the Princess and Mitarlis (2015: 344) states student worksheets can be exciting and motivating to students for presentation using the text, color and images in accordance with the material presented to help students understand the material and are interested open it.

Overall student worksheet developed has had a very valid criterion, so it can be used for the next stage. Sudjana (2004: 12) states that the validity regarding the accuracy of the assessment tools to the concept that assessed so truly assess what should be assessed. Meanwhile, according to Kimberlin and Winterstein (2008: 2278) Validity is defined as the extent to which an instrument measures what is intended to be measured. The validity of the instrument requires reliable.

VI. CONCLUSION

Based on the results of research and discussion can be concluded that the students' worksheets Oriented *Multiple Intelligences* developed has a very valid criteria from the aspect of content, language and presentation. Whereas the graphic aspect have valid criteria. So that the student worksheet Oriented *Multiple Intelligences* can be used during the process of learning as teaching materials that help teachers and students to understand the material and assist in achieving the learning objectives that can improve student learning outcomes.

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