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Validity of Student Work Sheet Based Guided Inquiry on Learning Materials of Organism Classification and Life Organization for MTs Students Grade VII

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***Abstract* – Curriculum is an educational response to societies' and nations' needs in developing young generation. The curriculum gives a significant contribution to bring the development process of students' potential in learning into reality. Learning of Science (IPA) emphasizes on the ability to do scientific inquiry to raise cognitive, affective, and communicative skills. IPA includes four main elements: attitude, process, product, and application. IPA learning process is expected to raise those four elements so that students can experience the whole learning process, and it can be used to solve life's problems. It can be reached by applying one learning model, that is 'guided inquiry learning model'. The learning process cannot also apart from learning materials. One of the materials is student work sheet, which is able to improve students' skill process. The aim of the research was to develop student work sheet based guided inquiry for MTs students grade VII and to validate its criteria. The research was a development research using Plomp model. The Validity of student work sheet based guided inquiry was obtained from the result of expert validity sheets done by four experts. The result of this research showed that in didactic aspect got 77,08% with the criteria was valid, construct aspect got 90% with very valid criteria, technical aspect got 85,93% with the criteria was very valid, and the average of these three aspects got 84,33% with the criteria was very valid. Student work sheet based guided inquiry was successful to be developed by validity criteria, which was very valid. Then, it is expected that it can be a qualified and innovative learning material to help improve students' learning competence.**

***Keywords* – Validity; Student Work Sheet; Guided Inquiry.**

I. INTRODUCTION

The challenge of Indonesian development in 21st century is to prepare the qualified, professional, and competent human resources in all sectors, especially in educational sector. It needs to prepare creative, sociable, and proactive generations. Education provides sufficient knowledge and skills to the students' life in the future or it is known as life of society in XXI century (Wayne, 2010).

Science, especially biology, has important role in pushing advancement of science and technology (IPTEK) because the development of biology is always attained the aims of learning toward mind on, hands on, and heart on skills development (Gamaliel dan Suciati, 2011).

The main objective of learning science is to help students develop skills in solving the problems by using learning model that is aimed at developing cognitive skills and relating it to the real world, concepts, and skills through scientific operational procedures (Dogru, 2008). 2013 curriculum learning is a learning process by using scientific and contextual approaches that emphasize on scientific

approach, including observing, asking a question, experimenting, associating, and communicating.

Based on the results of observation and interview with Science (IPA) teachers in MTs Darun Najjah Teratak Buluh, MTs Al-Munawwarah, and SMPN 4 Siak Hulu, it was found that there are some problems in learning process in school. First, related to existence of student work sheet in 2013 curriculum. Worksheet used by students is a sheet which is contained one sub-material and completed by some work-steps or experiments. The worksheets are given to the students a moments before doing experiments. Therefore, the existence of student work sheet IPA based on 2013 curriculum is needed, but the teachers still have difficulties in developing student work sheet suited with 2013 curriculum.

Second, when doing observation, the students was less involved in teaching learning process. They pretended to be passive and relied on their friends to work. In addition, they only pretended to listen teacher's explanation than being involved in the experiment so that students' ability in formulating and solving the problems in learning materials is still low. It is caused by learning source used has not been suitable to competence standard expected in 2013 curriculum. Therefore, in teaching learning process, it is needed various learning materials and media as an instrument to get the optimal learning outcome. Besides that, learning materials also play an important role to give clear picture about the objective of a lesson and what the students will do as its result.

Third, according to science (IPA) teacher in Mts Darun Najjah, Mr. Ahmad Syukri, S.Pd., the whole activities and teaching learning process has been in students' book. Based on the researcher's analysis on students' book work sheets, it is known that steps in doing learning activities have not been clear enough although the books have used scientific method; for example, the work sheets in activity 3.1 (observing bacteria) and activity 3.2 (observing fungi). In these work sheets, instruments, materials, and steps in doing the activity are just explained briefly. So, teaching learning stages by using scientific methods, like asking questions, observing, exploring or collecting information, associating, and communicating, are not well defined. Besides that, the worksheets do not contain the student work sheet components completely either.

Fourth, based on the interview with some teachers, students' mastery on organism and life organization is still low. It is caused by the students are difficult to understand and remember the learning materials because they are more theoretical than practical. In addition, students' skills in observation activities have not been developed, so that they are difficult to differentiate the organism characteristics, to differentiate phylum in animal kingdom and its classifications. On the other hand, for life organization learning materials, the students are difficult to understand the life organization levels, like cells, tissue, organ, organic system, and organism. It could be seen from data of students' average test score on organism learning material was 51.67% and on life organization was 61.3%, which mean the students do not achieve the minimum criteria of mastery learning (KKM).

The problems above need to be overcome in order to improve the teaching learning process. Some learning strategies could be applied to solve the problems. One of the strategies is developing learning materials, like student work sheet. The student work sheets are the sheets contain some exercises that must be done by students (Zahro, 2017). The student work sheet can facilitate students to interact with the given learning materials through some exercises so that students' mastery on the learning materials can increase.

Student work sheet needs to be supported by a model that encourages students to find a concept through independent innovation process, so that it needs to be supported by learning materials based innovation. Guided Inquiry Model is an appropriate model because it can encourage students to find a concept through innovation, such as in solving the problems, drawing conclusion, and producing a prediction that involve students actively in teaching learning process through students-centered activities (Eren and Sedar, 2013; Ketpichainarong *et al*., 2010). In addition, Rusche & Jason, 2011 assert that student work sheet based guided inquiry contains teaching learning activities that encourage students to analyze and solve the problems based on the facts found and designed to get conceptual understanding.

To know whether it is suitable or not, the developing student work sheet needs to pass some tests. One of the tests is validity test. Validity is an integral evaluative assessment to know to what extends the empirical evidence and theoretical reason that support compatibility of conclusion and action based on the scores or other measurement methods. In other words, validity is to what extends an instruments measures what to be measured (Thompson, 2013). A valid instrument is not only able to produce precise data, but also give accurate image about the data. Accuracy means that the measurements can give image

about difference between one subject with other subjects in detail.

The validity test is done to know the validity of instruments used. An instrument is valid when it can measure what is needed and reveal the data from variables accurately.

II. RESEARCH METHOD

This research was a development research. In other words, it was called a design research, this term was used by Plomp. A development research is an effort to develop and produce a product, like material, media, or learning strategy that can be used to solve the problems in the classroom and it is not used to test a theory.

The development of student work sheet based guided inquiry used Plomp model. This development model consists of three phases. They are: prelimenary research phase, development or prototipe phase, and assessment phase (Plomp, 2013). In prelimenary research phase, problems and needs analysis, curriculum analysis, and student work sheet analysis are done to get clear image of product that will be developed. Next, in development or prototipe phase, there are some steps done, they are prototype I, prototype II, prototype III, dan prototype IV. In assessment phase, testing of student work sheet is done to the real classroom.

In developing and creating prototype phase of the student work sheet based guided inquiry, validity test was done to prototype II by testing it to some experts. The validating of student work sheet based guided inquiry was done by 4 (four) experts. Then, the result is used to make revision so that student work sheet based guided inquiry has fulfilled the needs of users and been able to be applied in the real classroom.

The following is the expert validity instrument used in this research.

THE VALIDITY SHEET OF STUDENT WORK SHEET BASED GUIDED INQUIRY ON LEARNING MATERIALS OF LIVING THING CLASSFICATION AND LIVING ORGANIZATION

A. DEDACTIC ASPECTS

No	Assesment Indicator	Score			
		1	2	3	4
		STS	TS	S	SS
1	Teaching learning avtivities based guided inquiry facilitate the concept understanding.				
2	Teaching learning avtivities by using student work sheet based guided inquiry give various stimuli through students' activity				
3	Teaching learning avtivities by using student work sheet based guided inquiry can develop the communicative, social, emotional, moril, and aesthetic abilities.				
Total					

B. CONSTRUCT ASPECTS

No	Indikator Penilaian	Skor			
		1	2	3	4
		STS	TS	S	SS
1	Student work sheet based guided inquiry uses the Indonesian standard language.				
2	Student work sheet based guided inquiry uses the clear sentence arrangement				
3	Student work sheet based guided inquiry uses the right vocabularies				
4	Student work sheet based guided inquiry has material levels that can support teaching learning activities that will be done.				
5	Student work sheet based guided inquiry has regulation, user guide, and suitable with phases of guided inquiry				
Total					

C. TECHNICAL ASPECT

No	Assesment Indicator	Score			
		1	2	3	4
		STS	TS	S	SS
1	**Layout**				
	a. Using clear fonts				
	b. Using readable font size				
	c. Compatibility of punctuation				
	d. using appropriate and standard Indonesian sentences				
2	**Images**				
	a. images are suitable with the concept				
	b. image description is suitable with the image				
3	**Graphic**				
	a. compatibility of using colour composition in student work sheet b. Display design of student work sheet is simple and attractive				
Total					

Validity analysis used student work sheet validity data obtained from the analysis of data collection instruments, such as questionnaire filled by some experts. Data Analysis was begun by determining scores for each items. The determining scores are based on likert scale, like in Table 1 below.

TABLE 1. Likert Scale of Categories and Scores of items Student Work Sheet Based Guided Inquiry Validity

Score	Category
4	Very agree (SS)
3	Agree (S)
2	Disagree (TS)
1	Very disagree (STS)

Source: Yusuf (2007)

After that, scoring results were tabulated and percentaged by using the following forluma.

$$\text{Percentage of Validity} = \frac{\text{obtained score}}{\text{maximum score}} \times 100\%$$

Based on the validity score that was obtained, assessment criteria of validating student work sheet based guided inquiry were determined, like in table 2 below.

TABEL 2. Validity Categories of Student Work Sheet Based guided Inquiry

Validity Score (%)	Category
0-20	Not Valid
21-40	Less Valid
41-60	Valid Enough
61-80	Valid
81-100	Very Valid

Source: Riduwan (2009)

III. RESULT AND DISCUSSION

The validity of student work sheet based guided inquiry is based on the expert validity instrument items related to the steps in arrangement of student work sheet based guided inquiry, so that the student work sheet based guided inquiry on learning materials of organism classification and life organization is produced. Next, the student work sheet based guided inquiry is validated by some experts. The validity of student work sheet based guided inquiry includes didactic aspect, construct aspects, and technical aspects. The validators in this validity process were Mr. Dr. Darmansyah, ST, M.Pd as a technology expert, Mr. Dr.Abdurrahman, M.Pd as a linguist, Mr. Dr. Abdul Razak, M.Si and Mrs. Dr. Moralita Chatri, M.P as a learning material experts.

The following was the results of validity of student work sheet based guided inquiry.

RESULT OF VALIDITY ANALYSIS OF STUDENT WORK SHEET BASED GUIDED INQUIRY ON ORGANISM AND LIFE ORGANIZATION MATERIALS

A. DIDACTIC ASPECTS VALIDITY

Indicator	Validator Assessment				Total	Validity Score	Criteria
	1	2	3	4			
1	3	3	3	3	12	**77,08%**	**Valid**
2	3	3	3	4	13		
3	3	3	3	3	12		
Total	9	9	9	10	**37**		

B. CONSTRUCT ASPECTS VALIDITY

Indicator	Validator Assessment				Total	Validity Score	Criteria
	1	2	3	4			
1	4	4	3	4	15	90%	Very Valid
2	4	4	3	3	14		
3	4	4	3	4	15		
4	4	3	3	3	13		
5	4	4	3	4	15		
Total	20	19	15	18	**72**		

C. TECHNICAL ASPECTS VALIDITY

Indicator	Validator Assessment				Total	Validity Score	Criteria
	1	2	3	4			
1a	4	3	4	3	14	85,93%	Very Valid
1b	4	4	4	3	15		
1c	4	3	4	4	15		
1d	4	4	3	3	14		
2a	3	3	3	3	12		
2b	3	4	3	4	14		
3a	3	3	3	3	12		
3b	3	4	3	4	14		
Total	28	28	27	27	**110**		

Validity of student work sheet based guided inquiry was obtained from the result of validating by using expert validating sheet, including the suitability of student work sheet based guided inquiry with basic competition of organism classifications and life organization materials. The score of didactic aspect validity was 77,08% with the validity criteria showed that learning activity by using student work sheet based guided inquiry can facilitate the concept understanding, give various stimulus, and develop communicative, social, emotional, moril, and aesthetic skills. Student work sheet based guided inquiry is also equipped with some components of student work sheet. The components are:

1. Student Work Sheet Identity
   Student work sheet identity shows that the identity in student work sheet has been written clearly.
2. Core Competence and Basic Competence
   The determined core competence and basic competence have suited with those in materials presented in student work sheet.
3. Indicator of Competence Achievement
   The indicator of competence achievement has suited with the determined core competence, basic competence, and indicator of objective achievement in materials presented in student work sheet.
4. Learning Objective
   The learning objective has suited with the determined core competence, basic competence, indicator of objective achievements in materials presented in student work sheet.
5. Using Guided Inquiry Syntax
   Teaching and learning activities have some steps which are suitable with guided inquiry syntax. By using the guided inquiry syntax, student work sheet can improve students' cognitive, psychomotor, and affective competence.
6. Learning Materials
   The learning materials have been suitable with the determined core competence, basic competence, indicator of objective achievement, and learning objective of materials presented in the student work sheet based guided inquiry.
7. Exercises
   The exercises has been suited between the determined core competence, basic competence, indicator of objective achievement, and learning objective with the exercises presented in student work sheet.

The score of construct validity was 90% with the criteria 'very valid'. It shows that student work sheet based guided inquiry has been arranged with good innovation, able to attract and motivate students, and suited with steps of guided inquiry activities. Arends (2012) explained that there are some characteristics of activities in student work sheet suited with guided inquiry syntax. They are:

a) Students' orientation
b) Formulating the problems
c) Formulating hypothesis
d) Testing hypothesis
e) Collecting and analyzing data
f) Drawing conclusion.

Meanwhile, the score of technical validity was 85,93% with the criteria 'very valid'. It shows that the dictions in student work sheet have used the standard and no ambiguous words, had readable and clear fonts. Then, pictures and descriptions presented in student work sheet have been suited with learning materials, the colour

composition have also suited with learning materials, and the student work sheet layout design is simple and attractive.

The average score of validity was 84,33% with the criteria 'very valid'. It can be concluded that student work sheet based guided inquiry on organism classification and life organization learning materials can be used as the materials that can encourage students to be active in teaching learning process, support investigation activities, push students to cooperate in groups, and improve students' cognitive, affective, and psychomotor competence.

IV. CONCLUSION

Based on the research result and discussion, it can be concluded that learning materials on organism classification and life organization have been successful to be created in form of student work sheet based guided inquiry. The student work sheet based guided inquiry can be used as innovation in teaching learning process by inserting some aspects which support teaching learning activities. The developed student work sheet based guided inquiry has 'valid' validity in didactic aspects and 'very valid' in construct and technical aspects, so that student work sheet based guided inquiry can be used in teaching learning process to help students achieve basic competence to improve students' learning competences.

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