

STUDENT WORKSHEET TO PRACTICE GEOSCIENCE LITERACY FOR 7th GRADE JUNIOR HIGH SCHOOL STUDENTS

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Abstract

The aim of this study was to develop a feasible worksheet for 7th grade Junior High School students to practice geoscience literacy. The worksheet mainly focused on three aspects of scientific literacy: knowledge (content science); competencies (process science); and context science, and analogy observation which uses plate tectonic boundaries as its content. The Research design used in this study was Research & Development (R&D). The results showed that based on the modus of the worksheet was valid with score 4 for didactic, 4 for construction, and 3 for technical. The worksheet was also effective N-gain score was 0,81. Based on those results, it can be concluded that the developed student worksheet was very feasible to be used.

Keywords: Student worksheet, geoscience literacy, analogy observation

1. Introduction

In the 21st century, United Nations (UN) arranged an agenda called Sustainable Development Goals (SDGs). The agenda has 17 global aims and one of them is raising the quality of education. Indonesia as a UN member has responsibility to participate for achieving the SDGs' aims. The aim can be achieved by trained students a literacy skills. Situmorang (2018) said that students who have literacy skill will be strong foundation for education in Indonesia. PISA (OECD, 2016) ranked Indonesia in 62nd from 72 participants on scientific literacy. The Programme for the International Assessment of Adult Competencies (PIAAC, 2017) also ranked Indonesia in the last category for literacy, mathematics, and problem solving. Those facts make Indonesia need lot of efforts for practicing students a scientific literacy.

Scientific literacy is defined by PISA as an individual understanding about science on world, applying the science knowledge, explain phenomena scientifically, and make conclusion based on evidence (OECD, 2013). Scientific literacy has three areas of knowledge (content) and five areas of context. The three areas of knowledge are physical system which discusses about properties of matter, energy, force, etc. Living system which discusses about cell, concept of organism, population, etc. Earth and space system which on earth

system discusses about earth dynamic such as plate tectonics movement. The five areas of context are health, environment, natural resources, hazard, and science and technology (OECD, 2016).

Literacy which discusses about earth science is called geoscience literacy or earth science literacy. Ross (2010) defined geoscience literacy as an individual understanding on earth, earth dynamic, the impact of earth dynamic to human, and the impact of human activities to earth. Indonesia students must have geoscience literacy skills because based on Badan Meteorologi, Klimatologi, dan Geofisika (BMKG) (2013) Indonesia is on a ring of fire and meeting point of three major plate tectonics. The condition makes potential for eruption, earthquake, and tsunami for Indonesia becomes large. Based on those cases, students have to not only know the phenomenon but also have to understand and able to explain so that they can know well their environment. In reality, Hariyono (2014) said on his study about building geoscience literacy in understanding volcano dynamic of Indonesian student college, level of society's geoscience literacy is still low.

Beside that, the result of pre-research that has be done by researcher, it showed that the geoscience literacy for Junior High School 1 Cerme in VII-J Class was only 41,88% which categorized as low.

The low geoscience literacy skill is caused by lacking of teaching material. One of the teaching materials that can be used is student worksheet. Geoscience literacy can be trained using analogy observation because Jonane (2015) stated that students can compare an idea, a thing or process to something that is familiar or real through analogy. The geoscience literacy has tendency to the concept which is hard to explain in real.

The solution is developing an eligible student worksheet which uses analogy observation for practicing students about geoscience literacy.

2. Method

The study used Research and Development (R&D) and only be done until trial phase. Trial subject on this study are 30 students of Junior High School 1 Cerme in VII-J class. The student worksheet was validated by three validator, two lecturers of science education and one science teacher.

The data collection technique in this study was questionnaire method which include three aspects of validation. There are didactic, construction, and technical of student worksheet. The validation sheet assessment used Likert scale 1 to 4. Student worksheet eligibility determined through modus. The modus would be interpreted in criteria that can be seen in Table 1 below:

Table 1. Score Interpretation Criteria

Modus	Criteria
1	Not Feasible
2	Less Feasible
3	Feasible
4	Very Feasible

3. Result and Discussion

The student worksheet to practice geoscience literacy validated by three validators and the result can be seen in the Figure 1 below:

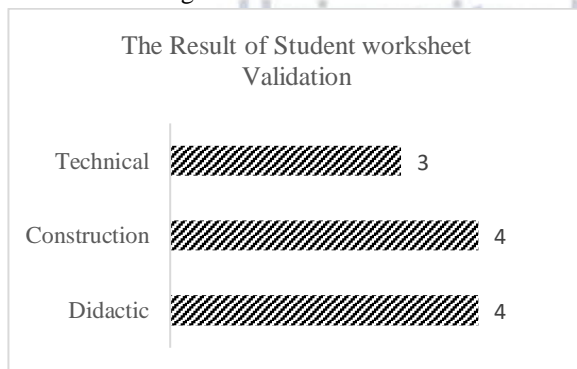


Figure 1. Validation Result

According to Fig. 1, the technical aspect got modus 3 which means the student worksheet is technically eligible, the construction aspect got modus 4 which means it is constructionally very eligible, and the didactic aspect got modus 4 which means it's didactically very eligible. Hendro and Kaligis (Arifah, 2018) stated that student worksheet is valid if the three aspects, didactic, construction, and technical, achieve its standard.

Didactic aspect has purpose for the use and content of student worksheet. Assessing points on this aspect are suitability of student worksheet with learning material and geoscience literacy, environment issue, the student worksheet has to include three aspects of scientific literacy. The student worksheet uses socioscientific's issue because students will be more understand if they learn and study about their environment. Richard (2009) explained that on scientific literacy, it will be better if using socioscientific's issue rather than other issue.

Construction aspect has purpose to make students worksheet is understandable for students. Assessing point on this aspect is the activity sequences of students worksheet. A learning material with simple-to-complex sequences design would make students easier to learn (Reigeluth, 2009).

Technical aspect has purpose for student worksheet's visual. Assessing points on this aspect are content layout, picture layout, font and language. According to Arifah (2018), student worksheet has to use a proper font so that students can easily read the content.

Based on those results, it can be concluded that the student worksheet was feasible to be used in learning process so that it was tested on students. It got N-gain score about 0,81 or high category for student's geoscience literacy enhancement. The result showed that the student worksheet is effective for practicing geoscience literacy for students.

At first, majority students' result on geoscience literacy skills was on very low category. The result can be seen in the table below:

Table 2. Students' Geoscience Literacy Skills on Pre-Test

Category of Students' Geoscience Literacy Skills on Pretest		
Category	Percentage (%)	Number of Students
Very Low	13,3	4
Low	80	24
Average	6,7	2
Good	0	0
Very Good	0	0

After treatment was given and did a post-test, majority students' result on geoscience literacy skills is on very good category. The result can be seen in the Table 3.

Table 3. Students' Geoscience Literacy Skills on Post-test

Category of Students' Geoscience Literacy Skills on Pretest		
Category	Percentage (%)	Number of Students
Very Low	0	0
Low	0	0
Average	6,7	2
Good	20,0	6
Very Good	73,3	22

4. Conclusions

Based on the results of the study, it can be concluded that the student worksheet which uses analogy observation for practicing geoscience literacy students is very eligible to be used in learning process. The modus for didactic aspect is 4, construction aspect is 4, and technical aspect is 4.

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