Development Of Student Worksheet Based On Ttw Learning Model To Improve Student's Communication And Observation Skills

Agustho Ayomi Tri Putra[1], Sabar Nurohman[2]

[1,2] Study Program of Science Education, Faculty of Mathematics and Natural Sciences, Universitas Negeri Yogyakarta

Abstract

Keywords:

Student worksheet, Think-Talk-Write (TTW), learning science, communication skill, observation skill.

This study aims to produce an appropriate of student worksheet based on TTW learning model to improve student's communication and observation skills on environmental pollution matter nd to describe the effectiveness of the student worksheet based on TTW learning model to improve student's communication and observation skills on environmental pollution matter. This study is a type of Research and Development (RnD) research with a 4D model which includes the steps of defining, designing, developing, and disseminating. The data analysis technique for the pretest and posttest scores of communication and observation skills is the paired sample t-test and the normalized gain score (n-gain score). The result show that developed student worksheet based on TTW learning model to improve students' communication and observation skills about environmental pollution matter is appropriate to be use in science learning with "very feasible" by expert lecturers and students' response questionnaire. In addition, the results also show that the student worksheet based on TTW learning model is effective to improve communication and observation skills. The communication and observation skills of students improve significantly after using the student worksheet based on TTW learnig model. The improvement of studets' communication and observation skills in the "medium" category with an N-gain score of 0,681.
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INTRODUCTION

The success of educational attainment is determined by the learning process experienced by students. Students who study will experience changes in both knowledge, understanding, skills, values, and attitudes. The strategy for achieving educational goals is to use a tool in the form of a curriculum. The 2013 curriculum demands students to be able to learn independently which emphasizes three areas that will become potential students, namely attitudes, knowledge, and skills (Kemendikbud, 2013). Learning related to these three aspects is learning that is oriented towards the Science Process Skills of students. The Ministry of Education and Culture (2019: 20) reports the results of a study from the Program International For Student Assessment (PISA) in 2019 showing that Indonesia's PISA score for science is 396 below the average PISA score of OECD member countries with a score of 489 while 89% of the Program Fore International questions Student Assessment (PISA) includes observing, predicting/predicting, applying concepts, and communicating.

Basic science process skills are skills to train students to be able to observe, ask questions, predict, clarify, measure, conclude, and communicate problems (Ibrahim, 2010:5). According to Doymus (2008:47) states that cooperative learning can also make learning active interactive, fun and improve students' communication and interaction skills. The TTW (Think-Talk-Write) type of cooperative learning model is an interactive type of cooperative learning and includes part of the process skills (Zulkarnain, 2011:6). The TTW learning model is in line with existing process skills and can be integrated with learning tools, one of which is LKPD.

Based on the results of observations in the implementation of educational practice at SMP Negeri 1 Galur regarding the learning process at the junior high school, it was known that there were problems with communication and observation process skills. The communication aspect for students of SMP N 1 Galur is still lacking, it is shown that students who tend to be less structured in processing information can be shown when learning takes place. Megawati (2016: 49) explains that communication skills are not only verbal communication or interactions between teachers and students, but are defined as the process of conveying information or results of observations or experiments so that they can be known and understood by others. The science process skills that are in the spotlight are the ability to observe. Dimyati and Mudjiono (2009:141-150) explain the observing aspect, namely the activity of observing objects, natural phenomena / phenomena that occur using the senses and communicating, namely conveying facts, concepts, and principles of science in the form of sound, visuals or both to solve problems.

METHOD

Types of research

The type of research is Research and Development (R&D) research with a 4D model (Define, Design, Develop, and Disseminat).

Time and Place of Research

This research was conducted at SMP 1 Galur during one month on Februari 2021 until March 2021

Population and Research Sample

The population in this study was class VII. The sample in this study was 10 students of class VIII D SMP Negeri 1 Galur.

Procedure

The design used in this study was the Pre-experimental One Group Pretest-Posttest.

$$\boxed{\textbf{O}_1 \ \textbf{X} \ \textbf{O}_2}$$

Figure 1. One Group Prettest-Posttest Pre-experimental Design

O1 = pretest value (before being given treatment)
O2 = Posttest value (after being given treatment)
X = Treatment

Data, Instruments, and Data Collection Techniques

Data collection techniques in this study were product validation questionnaires, student response questionnaires, and tests. Product validation is in the form of an assessment of product by expert lecturers. Student response questionnaires were used to test the readability of the student worksheet based on TTW by students. The test is in the form of pretest and posttest questions to measure students' communication and observation skills.

Data analysis technique

The data analysis technique in this study consisted of a feasibility test, a prerequisite test for the hypothesis, a hypothesis test, and an n-gain score. Guidelines for the eligibility score conversion formula can be seen in the following table.

Table 1. Conversion Score Scale Four

No	Formula	Score Interval	Score	Category
1	$X \geq X_i + 1.Sbi$	$X \geq 3$	A	Very good
2	$X_i + 1.SBi > X \geq X_i$	$3,00 > X \geq 2,50$	B	Good
3	$X_i > X \geq X_i - 1.Sbi$	$2,50 > X \geq 2,00$	C	Good enough
4	$X < X_i -1.Sbi$	$X < 2,00$	D	Not good
	Calculation			
	X : Score obtained	The average score obtained		
	X_i : average overall score = ½ (skor maksimal + skor minimal)	$½ (4,00 + 1,00) = 2,50$		

SBi : standard deviation of the overall score = (1/2)(1/3) (skor maksimal – skor minimal)	$1/6 (4,00 – 1,00) = 0,5$

(Djemari Mardapi, 2017 : 123)

The prerequisite test is the normality test, while the hypothesis test uses the paired sample t-test. To calculate the paired sample t-test the available data must be normally distributed (Dadan Rosana, 2016: 87). Therefore it is necessary to use the normality test first by using the One-Sample Kolmogorov-Smirnov Test.

The measurement of the improvement of science process skills was analyzed using paired sample t-test and n-gain score. The formula for the n-gain score uses the following formula:

$$Gain\ score = \frac{skor\ postscore - skor\ prescore}{skor\ maksimal - skor\ prescore}$$

The conversion of the n-gain score can be seen in the following table.

Table 2. Gain Score Conversion

No	Interval	Assessment Criteria
1	$g > 0,7$	High
2	$0,3 \leq g \leq 0,7$	Average
3	$g < 0,3$	Low

(Source: Hake, 1999: 1)

RESULT

The results of this development research are LKPD based on Think-Talk-Write (TTW) that are feasible and effective in science learning to improve students' communication and observation skills. The assessment is carried out by expert lecturers who act as product feasibility validators. The results of

media validation by expert lecturers are as follows:

Based on the diagram above, the average value shows that overall each aspect gets an X value > 3.0 with an average value of 3.42 so that according to (Djemari, 2008: 123) the assessment.
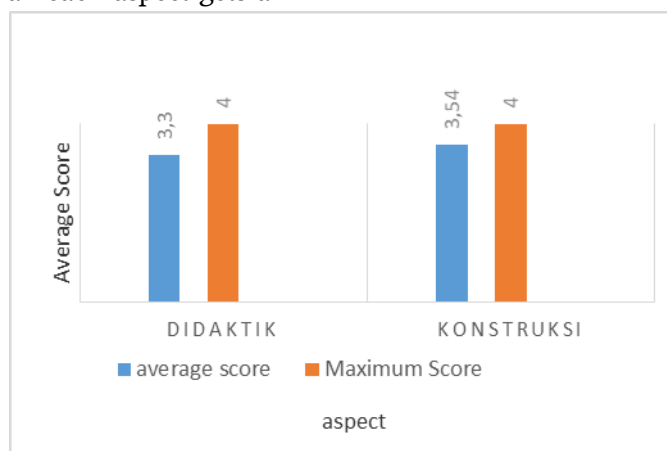

Figura 2. Feasibility Assessment of LKPD Materials

results are included in the "very feasible" category. So that it meets the valid qualifications in terms of material so that it is worthy to be tested in learning.
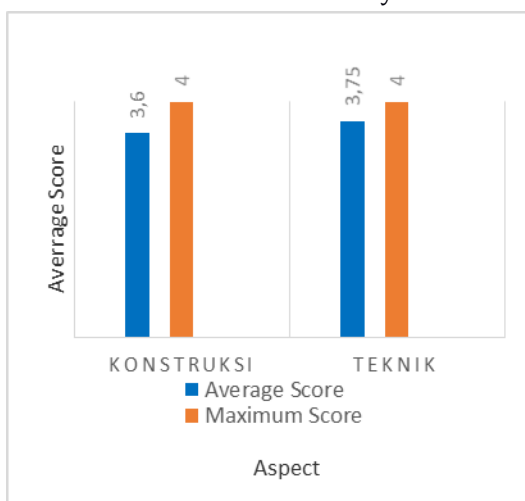

Figura 3. LKPD . Media Feasibility Assessment

Based on the diagram, the average score of the overall media assessment obtained is 3.78 with a very good category. The results of the assessment indicate that the TTW-based worksheets developed are suitable for use in terms of media, according to (Djemari, 2008: 123) the results of the assessment are included in the "very feasible" category and meet valid qualifications in terms of media so that they are worthy of trial in learning

The results of the feasibility assessment of TTW-based LKPD media and materials are included in the very feasible category, after the TTW-based LKPD is declared feasible by expert lecturers, researchers conduct product trials and readability tests. The product trial was carried out with the pretest-posttest question instrument, this question aims to determine the improvement of students' communication and observation skills after being given a TTW-based LKPD, communication and observation skills are measured using pretest and posttest questions that have been validated by experts. Based on the results of the pretest and posttest, an analysis was performed using a paired sample t-test and a normalized gainscore (N-gain score). The analysis was carried out with the

help of SPSS version 24 software. The results of the pretest and posttest of students' communication and observation skills. . The

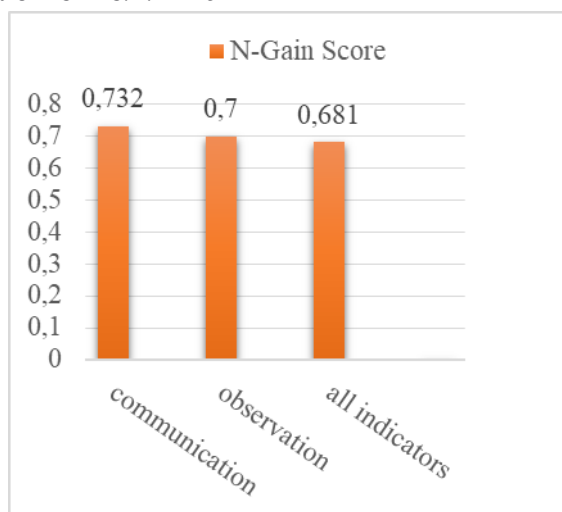results of the N-gain score analysis can be seen in Figure.

Figure 4. KPS N-Gain Score result diagram

The calculation of the n-gain score aims to determine the improvement of students' communication and observation skills. Based on the diagram, the overall score of communication skills and student observations is in the "moderate" category with an n-gain score of 0.681 after using TTW-based LKPD, with a score on the communicating skills indicator is 0.732 and the observation indicator is 0.7. The achievement of communicating indicators gets a high category because this TTW-based LKPD encourages children to carry out communication activities, both reading charts, communicating orally and in writing. This is in line with the opinion of Atin Supriatin (2014: 3) which states that science communication skills include reading graphs, tables, or diagrams from observations. The observing aspect also gets a high category, because in the TTW-based LKPD there are readings, videos and pictures to observe which encourage students to observe using the senses as optimally as possible. . This is in line with Rofiah (2015: 2-3) which states that observation is collecting data about phenomena or events using their senses, to be able to master observing skills, students must use as many senses as possible.

Based on the research results, it is known that TTW-based LKPD can improve

communication and observation skills, this LKPD makes it easier for students to understand the material provided, minimizes the role of educators but activates students more, and as teaching materials this LKPD is also concise and facilitates the implementation of teaching to participants. educate. This is in line with the opinion of Ayu Rahmadani (2012; 30) which states that LKPD can facilitate and be effective for students in the teaching and learning process.

CONCLUSION

Based on the results of the research and discussion, it can be concluded that (1) TTW-based LKPD (Think-Talk-Write) developed by researchers is suitable for use in science learning the material "environmental pollution and its impact on the ecosystem", according to the material expert lecturer. (2) TTW-based LKPD (Think-Talk-Write) products developed by researchers are effective in improving students' communication and observation skills. The improvement of the communication and observation skills of these students in the analysis using the N-gain score obtained the "medium" category, which was 0.681.

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