Activities of students in using worksheet based on Contextual Teaching and Learning

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Abstract. This study aims to describe the activities of students in using student worksheets based on Contextual Teaching and Learning (CTL). The method used is descriptive quantitative. Student worksheets based on Contextual Teaching and Learning that are used in learning consist of three sub-layers are atmosphere, lithosphere, and hydrosphere. In CTL-based student worksheets, there are 7 main components of CTL are constructivist, questioning, modelling, finding, community learning, reflection, and authentic assessment. Learning outcomes using CTL-based Student Worksheets are easier for students to understand learning material, this is shown by students in solving problems on student worksheets properly. Based on the results of the study it can be concluded that learning by using Student Worksheets based on Contextual Teaching and Learning helps students more easily understand the subject matter.

1. Introduction
The Indonesian government always strives to improve the quality and quality of education. One effort that has been made is through improving the curriculum. The curriculum applied in Indonesia today is the 2013 Curriculum. Learning in the 2013 Curriculum emphasizes learning that can develop student creativity and student-centred. In addition, the Ministry of Education and Culture [1] emphasizes that the 2013 Curriculum is also expected to encourage students to be better able to make observations, ask questions, reason, and communicate about what they have obtained or known after receiving learning materials [1].

The learning process as expected by Curriculum 2013 is certainly expected to be implemented in all subjects both Natural Sciences (Science) subjects and other subjects taught in Junior High School or equivalent. Science learning is currently demanded active learning which is implicated in physical or mental activities, not only includes hands-on activities but also minds-on [2]. The science learning process in the 2013 Curriculum emphasizes providing direct experience to develop competencies in order to explore and understand the natural environment scientifically [3].

Science is a systematic study of nature and how it affects life and the environment [4]. This definition is certainly very supportive of what is expected in the learning process in the 2013 Curriculum. Indeed science does not only consist of a collection of knowledge or various types of facts that must be memorized but Indeed science also consists of an active process of using thoughts in studying natural phenomena that have not been disclosed. Science (Natural Sciences) is a subject at the junior high school level related to how to systematically find out about nature.

Based on Piaget's Cognitive Development Theory, children of middle age (12-15 years) have not fully been able to think abstractly. During the learning process, the presence of concrete objects is still needed. Even so, semicircular objects are introduced. But at this junior high school level, children have begun to be able to apply thinking patterns that can lead them to understand and solve problems. The
ability to understand certain material learned is included in the category of understanding. At the level of understanding, students are required to be able to answer questions in their own words and by giving examples related to principles or concepts. In science learning, there are many concepts that must be learned, but these concepts should not be a problem for students because science is very much found in everyday life. According to [5] understanding concepts is the ability of students who not only understand but also can apply the concepts given in solving problems, even to understand new concepts.

The results of the interview with the VII A grade science teacher at SMP 2 Menganti Gresik said that the level of conceptual understanding of students in class VII A was considered to be lacking. Middle exam of odd semester results shows that 70% of students in class VII A has not reached the completion limit. In addition to conducting observations in the form of tests of students' understanding, researchers also gave questionnaires to respondents regarding the process and learning media used during science lessons. Based on the results of the questionnaire it is known that students have never been given a learning device in the form of Student Activity Sheet (SAS) by the teacher during the science learning process in the classroom, students also never do lab work and make presentations. The teacher in class VII science teaching said that so far the science learning process only used the 2013 Curriculum Science package.

There must be an effort made by the teacher so that the concepts that students receive become better. Learning that can be used to foster student awareness of science as a science related to daily life and able to facilitate students in understanding the material is through a contextual approach or Contextual Teaching and Learning (CTL). The CTL approach is a learning approach that links the conditions of everyday life with the concept of learning. According to [6] with learning using the CTL approach, educators are expected to be able to associate the learning material that they teach with real-world situations of students to encourage students to make a connection between their knowledge and application in their daily lives involving seven main components of CTL learning, namely: (1) constructivism, (2) asking, (3) inquiry, (4) learning society, (5) modeling, (6) reflection, and (7) authentic assessment. [7] also revealed that contextual-oriented learning is expected by students to be able and accustomed to discovering their own concepts in the material being studied.

The CTL approach with 7 main components in the learning process can be trained to students with the help of SAS. According to the [2], the purpose of providing SAS is to provide opportunities for students to play an active role and help students to develop and find concepts through science process skills, and also as a guide for teachers and students in the learning process. SAS can be used as a guide or steps in the activities of experiments, demonstrations and discussions. In general, SAS is a translation or development that comes from student books. The results of the questionnaire distributed to respondents stated that 89% of students agreed that science learning uses SAS to improve their cognitive abilities.

Based on the review of learning topics in Curriculum 2013, one of the material that requires learning resources in the form of SAS to help understand students' concepts is the topic of the structure and layers of the earth. These topics are in class VII in Basic Competencies 3.10 Describe the earth layer, volcanoes, earthquakes, and risk reduction actions before, during, and post-disaster according to the threat of disasters in the area and KD 4.10 Communicate efforts to reduce disaster risk and impact nature and actions to save themselves in the event of a disaster in accordance with the type of disaster threat in their area. This topic was chosen because on this topic, students are required to understand the layers of the earth which consist of atmosphere, lithosphere and hydrosphere. concepts that students must understand in the earth layer material include Explaining the Earth's atmosphere, comparing the layers in the atmosphere, giving examples of activities that occur in the atmospheric layers, concluding the causes of holes in ozone, explaining the lithosphere's earth layer, summarizing tectonic theories plate, describes the process of recycling water, interpreting the evaporation and condensation process, classifying the water recycling cycle. This material can not be separated from the environment of students, through asking questions, learning communities, giving modelling, reflection, finding and constructivists as well as authentic assessments later students will be encouraged to find concepts on the topic themselves.
Some of the research that has been carried out regarding the use of the Contextual Teaching and Learning approach in learning shows a positive impact on students, including the Research by [8] showing that the use of CTL-based modules can improve students' reading skills. This can be seen from the calculation of the t-test in SPSS 17.0 for windows which shows that the experimental group's post-test score increased significantly than the control group's score. The results of the interviews also show that students get many benefits through the use of CTL in classroom activities, including helping students gain a better understanding of the material through various media used in the learning process that helps them understand the material being studied; motivate students to learn because they can share knowledge and work together in completing assignments.

2. Method

The method used in writing this article is a quantitative descriptive method. According to [9], descriptive methods are procedures for solving problems that are investigated by describing or describing the state of the subject or object of research (someone, institution, society, etc.) at present based on visible facts.

3. Results and Discussion

Learning by using the Contextual Teaching and Learning approach that is trained through the student activity sheet is able to facilitate students in understanding the subject matter. This is indicated by the completeness of students in completing tasks on the increasingly increasing worksheet. Increased student completeness in completing worksheets assignments is shown in Table 1.

| No | Indicator | Worksheet 1 | Worksheet 2 | Worksheet 3 |
|----|-----------|-------------|-------------|-------------|
| 1  | Interpretation | 70%         | 100%        | 100%        |
| 2  | Summarize  | 83%         | 83%         | 100%        |
| 3  | Example    | 67%         | 100%        | 100%        |
| 4  | Compare    | 100%        | 100%        | 100%        |
| 5  | Categorize | 73%         | 100%        | 100%        |
| 6  | Explain    | 87%         | 87%         | 93%         |
| 7  | Conclude   | 87%         | 97%         | 100%        |

The Student Activity Sheet used in learning uses the CTL approach. According to [10] in essence, CTL is a concept that helps teachers associate the material they teach with real-world situations and encourage students to make connections between the knowledge they have and their application in their lives as family members and society. CTL learning as an approach has 7 principles or components that underlie the implementation of the learning process, namely constructivism, asking questions, modelling, finding, learning society, reflection, and authentic assessment [6].

Constructivism emphasizes the building of one's own understanding actively, creatively, and productively based on prior knowledge and knowledge and from meaningful learning experiences [11]. The SAS developed has included examples and cases in real life as in worksheet 3 namely floods and droughts that sometimes occur in Gresik. This is to support the constructivist CTL principle in learning. Through the CTL constructivist principle, students can understand the material in the indicator explaining that is explaining the efforts that must be made during a flood (worksheet 3) and so on because students will learn more easily by finding their own knowledge so that they can more easily understand and explain the knowledge obtained. Students can also relate the knowledge gained with examples of application in daily life (exemplifying). As shown in the worksheet 3 students were asked...
to exemplify the waters on earth. Students will be facilitated in terms of exemplifying the existence of constructivist CTL principles because students have found a lot in real life. According to [7] Learning activities are packaged into a process of constructing knowledge so that learning starts from what students know. It is expected that students are able to find new ideas and knowledge (concepts, principles), apply ideas, then learners look for effective learning strategies to achieve competence and provide satisfaction with discovery.

In worksheets that have been developed, there is a column asking to be filled by students. After linking material to students' daily lives in the constructivist component, the teacher provokes students to ask questions regarding learning. In CTL learning that has been done, the teacher does not simply convey information but provokes students to find themselves. Through the principle of CTL, questions help students in understanding indicators of concepts summarize because these questions can help students to summarize the material they obtained. Worksheet 2 (atmosphere) students will be led to make questions related to the temperature of the earth, with these questions will help students to simplify summarizing the causes of the earth's temperature which increases as well as worksheet 1 and 3. Therefore, the asking role is very important as the teacher's way of guiding and directing students to find every material they learn [7].

Students conduct an investigation to find answers to the questions that exist. The CTL modelling component helps students to carry out the investigation process. The three CTL based worksheet used are equipped with CTL modelling components for students, namely in the form of an inquiry design. After carrying out the investigation plan of the earth convection process contained in worksheet 1 (lithosphere) students will be facilitated to understand the material being studied because students see and are directly involved in the process of finding the answer. The CTL component found is a core part of CTL-based learning activities. The knowledge and skills students acquire are not the result of remembering a set of facts, but the results of finding themselves. After conducting an investigation students will find data related to the material being studied. Examples of finding activities are on worksheet 2 (atmosphere) students do activities to find differences in the temperature of the earth through investigation. Through these activities, students can compare different temperatures of the earth.

Students will analyze the data obtained in groups after finding the results of the investigation. Through the principle of the learning community, students will conduct analysis by answering questions to help understand the material of the earth's layers. The concept of a learning community (Learning Community) in CTL learning outcomes is obtained through cooperation with other people, friends, between groups, other sources and not just teachers [6]. Learning outcomes can be obtained by discussions between friends, between groups, and between those who know who don't know, both inside and outside the classroom.

At the end of the worksheet based on Contextual Teaching and Learning, there are reflection activities. CTL reflection components as according to [6] is a process of deposition of experiences that have been learned by reordering the events or learning events that have been passed. In CTL learning, each end of the learning process, the teacher provides opportunities for students to reflect on or recall what they have obtained. Through reflection activities, students can improve their understanding of the material they have learned. Reflection also helps students strengthen students' memories of the material they have learned. Worksheet developed has been completed with reflection activities at the end of the activity, such as on worksheet 2 (atmosphere). In worksheet 2 students and teachers review the learning outcomes related to increasing the temperature of the earth so that students can deduce the causes of the temperature of the earth which is increasingly increasing.
The seventh component of the CTL approach is authentic assessment. Real assessment of authentic assessment is the process by which the teacher collects information about the development of student learning. This assessment is needed to find out whether students really learn or not, whether student learning experiences have a positive influence on students' intellectual or mental development. CTL learning emphasizes the learning process not just on learning outcomes [6]. During the learning process, each group will be assessed based on the learning assessment sheet as an authentic assessment. Authentic assessment is used to give rewards to students at the end of the teaching and learning process. The purpose of giving rewards or awards so students are more enthusiastic to improve their achievements. Ngalim Purwanto [12] explains the purpose of giving rewards is to educate children so they can feel happy because their deeds or work get an award. In addition, the purpose of giving rewards is also to increase students' willingness to improve or enhance their achievements.

4. Conclusion
The learning process using the CTL approach that is implemented in Student Activity Sheets can help students understand the subject matter more easily. This is indicated by an increase in students' completeness in solving questions on the worksheet.

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