Effectiveness lekers mulia (student worksheet based on multimedia) and the level of knowledge on the attitude of environmental responsibility

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Abstract. National Education goals to provide the character of students, one of which is the attitude of environmental responsibility. The current global environmental issues became a very crucial issue. Attitudes of student responsibilities need to be established primarily starting from the level of education. Environmental learning and environmental attitudes must begin was provide in classroom. This study aims to examine the effectiveness of student worksheet based on multimedia on environmental pollution subjects to improve student's environmental responsibility. Successful formation of environmental responsibility attitude is also influenced by students' knowledge of environmental issues. The research method is quasi experiment, the effectiveness of student worksheet based on multimedia influence of environmental pollution material and level of knowledge on student environmental responsibility attitude. The study was conducted in Biology Education Program of FMIPA UNJ in March 2017 until Mei 2018. The sample of the study was the students of class X At 5 Schools in the Banten Province. Media development results obtained on http://lekersmulia.co.id. The result of normality test showed the result of value (p> .05), p = 0.58 and homogeneity test with value (p> .05), p = 0.060, the data showed normal and homogen. In the result of hypothesis test using 2 way anava test showed value (p≤.05), value p = .00, it showed that there is influence of Lekers Mulia and Level of Knowledge to Attitude of Environmental Responsibility.

1. Introduction

Environmental problems are a complexity that must be resolved. Environmental problems are a problem that involves many parties ranging from the Government as policy makers to the people who take part in protecting the environment. Environmental sustainability can be maintained if the community understands knowledge and has an environmentally responsible attitude, because the community will never be separated from the environment. The level of knowledge, skill, and attitude towards environmental responsibility that is owned by the community greatly influences the sustainability of the ecosystem (Meerah, Halim, and Nadeson, 2010).

Environmental learning must have been invested in classroom learning. A well-conveyed environmental education will form students who have good knowledge, skills, and attitudes towards environmental responsibility that will form a society that cares for environmental sustainability. The
key to beginning in maintaining the environment starts from school education (Meerah, Halim, and Nadeson, 2010). The success of learning about the environment one of which is by linking environmental theory with everyday life, namely by carrying out independent structured activities using learning tools. Structured independent activities are student-centered, where the learning process prioritizes the experience of participants through the process of observing, asking, reasoning, and trying (Ministry of Education and Culture, 2013). One of the learning tools is the Student Worksheet (LKS). LKS is a worksheet containing information and instructions from the teacher to students so that they can work on their own learning activities, through the practice or application of learning outcomes to achieve instructional goals (Ekosari, 2009).

Structured student worksheets contain 3 stages, namely doing, observing, and analyzing (Trianto, 2008). In this study used will develop the Lekers Mulia (Worksheet based on Multimedia) environmental pollution material that contains observation activities, group experiment activities, making recycled products and exercises. Each activity contains learning objectives, brief material, materials and tools, ways of working that lead students to do their own learning activities and achieve learning goals, as well as discussion questions. Brief material is equipped with videos, comics and pictures that support the material (Anleigh, 1996). The workings of each activity use video, so that students are more easily understood. The results report from each activity can be filled by students in the page that has been provided and automatically sent to the teacher's email. Question exercises are carried out online and interactively. Students can immediately know the results of their training when they finish working on the questions, so that students can know their own development (Azhar, 2008).

The formation of character or attitude towards environmental responsibility of students is very influential from the formation or attitude that a teacher has. A teacher who has good knowledge will have a good attitude towards environmental responsibility. The attitude will be directly proportional to the level of knowledge (Sadik and Sadik, 2014). This study is to measure the influence of the use of multimedia-based worksheet media and the level of knowledge of students' responsibility towards the environment.

2. Literature Study

2.1. Attitude of Environmental Responsibility
Kaplan (2000) expresses responsibility including feelings and obligations to do what should be done properly and correctly. A person will be responsible for the awareness and realization or understanding of all actions and consequences. The emergence of responsibility because humans live in a community and live in a natural environment. Humans must not do whatever they want to humans and their natural environment. Humans create balance, harmony, harmony between humans and the environment.

2.2. Lekers Mulia (Worksheet Based on Multimedia)
Ratna Wilis Dahar (in Ekosari, 2009) revealed that student worksheets are worksheets that contain information and interactions from teachers to students so that they can do their own learning activities, through practice or application of learning outcomes to achieve instructional goals. Biology learning students experience many difficulties in learning. Therefore the teacher must be able to find a solution to improve the quality of learning. Can use several techniques in learning or by paying attention to four basic components in learning learning conditions, student characteristics, material, and learning outcomes tests. Materials include the use of appropriate learning resources (Dunlosky, et al, 2013). Learning with electronics or computers is a new paradigm in a modern education. Improved electronic based learning up to 35.6%. Learning with electronic learning resources is a learning or the latest trend today. With this type of learning students will get more satisfaction (Sun et al, 2008). The use of learning resources such as books, modules, worksheets (LKS), and practicum guides based on multimedia will provide increased knowledge of students compared to students who do not use multimedia-based learning resources (Suprapto, 2018).
2.3. Correlation between Level of Knowledge with Attitude of Environmental Responsibility
In the taxonomy of the development developed by Krathwhol, that knowledge is in the second strata (C2) after remembering and is included in the structure of cognitive process dimension (Krathwhol, 2001). In forming the attitude of student responsibility towards the environment students must have prior knowledge about the environment and environmental damage, so that students can find out what attitude to do when they encounter problems in the environment (Meerah, 2010)

3. Methodology

3.1. Time and Place of Study
This research was conducted in Province of Banten in 5 schools with a sample of 380 students. With the number of samples in the control class as many as 190 students and the experimental class as many as 190 students. This study was conducted in February 2018 to June 2018.

3.2. Research Approach and Method
The research method used is a quasi-experimental method with a 2x2 research design, with variable X1 (Use of Lekers Mulia), X2 (Level of Knowledge) and Variable Y (Attitude of Environmental Responsibility). Research Design can be seen in the following table:

| Media in Learning | Level of Knowledge |
|-------------------|--------------------|
| (A)                | (B)                |
| Lekers Mulia (A1) | High Level (B1)    |
| Printed Media (A2)| A1B1               |
|                   | Low Level (B2)     |
|                   | A1B2               |

4. Result And Discussion
As for several stages before testing the hypothesis on the average value of the attitude of environmental responsibility of the experimental class with the experimental class. The value compared is the posttest value minus the pretest value and the gain score is obtained to be tested for effectiveness. Here is the description below:

4.1. Normality and Homogenity
The first step is to do a normality test, this test is done to find out whether the data is normally distributed or not. Normality and homogeneity test using Kolmogorov Smirnov test and Bartlet test. The following are the calculation results:

| Name      | Normality | Homogenity |
|-----------|-----------|------------|
| Data Group| 0.58      | 0.060      |

Accept H0 If the value (p>.050) and reject H0 if the value (p<.050), the calculation results in the table above shows p>.580 which indicates that the data from all four data groups is normal. Next is the homogeneity test with the Bartlet test, the result is received H0 if the value (p>.050) and reject H0 if the value (p<.050), the calculation results in the table above shows p>.060 which shows that the data from the four groups the data is homogeneous.

The final step is a two-way ANOVA test to determine the use of the Lekers Mulia effective in learning before and after being given treatments and measuring the influence of the use of Lekers Mulia and Knowledge Level on Environmental Responsibility. In the calculation results show the value of p = .000 which means (p≤.050), the conclusion of using the Lekers Mulia has an influence on the attitude of environmental responsibility after being given treatment. The next hypothesis is Malalui calculation with 2-way Anava test through measuring the level of knowledge on the attitude of environmental responsibility values (p≤.050), on the calculation results show the value of p = .000
which means \( p \leq .050 \), the conclusions of knowledge affect the attitude of environmental responsibility, then is to prove the hypothesis that measures the interaction between the use of Lekers Mulia and the level of knowledge of environmental responsibility attitude, obtained results \( p \ (.050 \), the results of the calculation show \( p = .000 \) which means \( p \leq .050 \), the conclusion is that there is an interaction between the Use of Lekers Mulia and the level of knowledge influencing the attitude of environmental responsibility.

4.2. Discussion

Biology learning, especially in environmental material, is a hot issue at this time, where environmental problems are a problem globally. The importance of this issue, then learning about the environment must be taught as best as possible. Learning about the environment must start from the home environment, and the cultivation of knowledge about environmental concerns and responsibilities has been taught early on at the elementary to tertiary level (Ors, 2012). Planting about the concepts and attitudes of environmental responsibility in schools will have an impact on the formation of the character of the community that cares for the environment (Desfandi, 2015). The success of learning can be supported by many factors, but one of the most important things is the media and learning resources used. The right media and learning resources make learning more effective and quality. One of the media and learning resources based on Multimedia is one of them. Learning based on multimedia will provide much greater learning satisfaction than conventional learning (Sun et al, 2008). Multimedia is a computer-based technology that combines text, visuals, images, graphics, and effects that are able to facilitate various kinds of students in learning (Khlaid, 2014). Multimedia can facilitate students in understanding their own knowledge (Dunlosky et al, 2013).

The current curriculum requires students to be able to study independently especially in learning biology. So that the media and learning resources used must be able to facilitate students to be more active and independent in learning. The use of Student Worksheets can reduce student passivity so students are more active, because students must solve problems that require students to look for the facts of each problem (Sudjana, 1989). Student Worksheet is a media that can guide students in understanding a concept in a structured manner (Arsyad, 2008). The combination of Student Worksheets and Multimedia such as Lekers Mulia (Multimedia Student Worksheet), is able to guide students more independently and will provide a different nuance of learning. Learning will be far more effective, because students can construct their knowledge independently (Khalid, 2014).

The purpose of this study is that students after using the Student Worksheet based on Multimedia (Lekers Mulia) on environmental material can increase the attitude of environmental responsibility. The attitude of environmental responsibility is used as the main variable that is measured, because this variable is important as goals after studying environmental material. Environment is a warm global issue at this time. Pollution and environmental damage currently occur due to lack of responsibility from the community to protect the environment. While the attitude of environmental responsibility is very important, because the attitude of environmental responsibility is a wise and conscious attitude in using natural resources and paying attention to the carrying capacity of the environment for sustainable life (Chiras, 1991). Responsibility is also a very important thing to be formed especially for students who are the successors of the future environmental management. The attitude of responsibility that exists in students will make students more sensitive to the environment which will make students to prevent actions that damage the environment and have a great responsibility to protect the environment (Neolaka, 2008).

From the results of this study can be seen in the table that the value of normality is \( p > .005 \) for the values of 4 groups shows that the data is normally distributed. From the table it can also be seen that the homogeneity value is \( p > .005 \) for the values of the 4 groups which indicate that the data is homogeneous. Furthermore, the calculation of the value with two-way ANOVA test is used to measure its effectiveness, from the results. The calculation results show the value of \( p = .000 \) which means \( p \leq .050 \), the conclusion of the use of Lekers Mulia has an influence on the attitude of environmental responsibility after being given treatment. The next hypothesis is Malalui calculation.
with 2-way ANOVA test through measuring the level of knowledge on the attitude of environmental responsibility values ($p \leq 0.05$), on the calculation results show the value of $p = 0.000$ which means ($p \leq 0.05$), the conclusion is the level of knowledge influential towards the attitude of environmental responsibility, then is to prove the hypothesis that measures the interaction between the use of Lekers Mulia and the level of knowledge of environmental responsibility attitudes, obtained results ($p \leq 0.05$), the results of the calculation show $p = 0.000$ which means ($p \leq 0.05$), the conclusion is there is an interaction between the Use of Lekers Mulia and motivation to influence the attitude of environmental responsibility.

Classes that use Lekers Mulia are better than classes that do not use Lekers Mulia in their learning. Because the Lekers Mulia that are developed combine images, persistence, animation, graphics, and effects that can attract students to study. The combination of all aspects that make up a multimedia will have a big impact on learning, especially increasing student interest in learning. Students who are already interested in learning will be easier and motivated to learn and construct their own understanding (Khalid, 2014). Students who understand environmental pollution material properly through the use of Lekers Mulia will be more aware and have an attitude of responsibility towards environmental damage. Students who have the motivation to succeed must be given challenging work and vice versa if students who are less motivated should be given work that can be done with good results. If learning motives or motivation arise every time learning, it is likely that the learning outcomes will increase (Nugraheni, 2013).

In a study it was found that the dissemination of information or learning about the environment and its problems, more effectively using media such as social media or by using the internet as in the website (Ors, 2012). Websites such as Lekers Mulia are a means to build and instill the values of environmental responsibility. The Lekers Mulia developed is a multimedia-based learning media through the website. The use of the website will be able to increase knowledge, attitude of concern for the environment which will have an impact on the formation of an attitude of environmental responsibility. The developed lekers are equipped with online-based worksheets that provide opportunities for students to observe in the environment. Student Worksheets that are carried out in groups are divided into 3 parts. Observations are made on changes or damage to the environment around the student's life.

There are experiments conducted by students to determine the impact of household waste on the life of aquatic biota. Experiments were carried out on several fish that had been given waste in it. How does the fish respond to the waste. By observing directly in the environment and combining with the use of multimedia-based websites will increase environmental awareness by $73\%$ and increase environmental responsibility by $65\%$ (Ardianti, Wanabuliandari, Rahardjo, 2017). Learning with an experimental approach or by using an experiment will provide information on knowledge that will shape the attitude of environmental responsibility (Torkar, 2014). Through learning media that is used is expected to build students' concern for the environment through the planting of environmental values (Slavoljub et al, 2015).

Knowledge is important in building an attitude of environmental responsibility. Students who have knowledge of the environment will have a tendency to have an attitude of environmental responsibility. The establishment of an environmental responsibility attitude that is formed starting from the school level will have an impact on the formation of a community that cares for the environment (Meerah, 2010). The formation of students' knowledge can be done if students have good motivation to learn and understand material about the environment. The use of learning media in the form of Multimedia will have an impact on increasing motivation in learning which will have an impact on increasing knowledge of the environment, increasing knowledge will have an impact on attitudes towards environmental responsibility (Biskupic, 2015). Based on the results of research students who use the internet in learning will have a high sensitivity to the environment. Environmental sensitivity will have an impact on the formation of an attitude of environmental responsibility (Sadik, 2014).
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6. Conclusion
From the results of the discussions that have been reviewed previously, it can be concluded that the use of Lekers Mulia before and after being given treatment or using the Media shows good effectiveness. Groups that use Lekers Mulia are better than those who do not use Lekers Mulia, for example conventional learning. Level of Knowledge in learning influences the attitude of environmental responsibility. As well as the Use of Lekers Mulia and the level of knowledge affect the attitude of environmental responsibility.

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