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Implementation of Based Teaching Materials Green Education and Its Effect on Understanding Concepts of Junior High School Students

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Abstract. This study aims to (1) describe the effect of implementing based learning devices Green Education on the understanding of junior high school students' concepts in Sumbawa Regency and (2) describe differences in understanding the concepts of junior high school students in Sumbawa Regency through implementation based learning tools Green Education. This type of research is a pre-experimental design with a plan One Group Pretest-Posttest Design. The study population was all junior high school students in Sumbawa Regency, with the sample being class VII students at SMPN 1 Lenangguar and SMPN 4 SATAP Lenangguar. The research instrument uses tests to measure students' understanding of concepts and data analysis techniques using inferential statistics, namely analysis N-gain and free sample t-test. The research results show that; (1) there is the influence of learning-based devices green education to understanding the concept of SMPN 1 Lenangguar students and students of SMPN 4 SATAP Lenangguar with N-gain respectively 0.4 and 0.5 in the medium category, and (2) there is no difference in students' understanding of concepts in the two experimental schools ($p = 0.354 > 0.05$).

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INTRODUCTION

Environmental education, also known as green education, is an alternative to solving environmental problems, which is carried out through educational channels to instil conceptual understanding in students (Su'udiyah & Tirtoni, 2018). Planting concepts to students is inseparable from the role of the teacher and the learning tools used. It is evidenced by previous research studies which show that learning devices affect students' conceptual understanding (Goddess et al., 2013; Miswadi & Haryani, 2013). Learning devices are a series of agendas that the teacher must prepare before carrying out the learning process (Fatmawati, 2013). Learning tools can include syllabi, lesson plans and teaching materials (Rasyid, 2017). Furthermore, Praswoto (2011) explained that teaching materials are all used to assist the learning process. One of the teaching materials that can instil conceptual understanding in students is comic learning media.

Comic learning media is designed with pictures and story sequences determined according to the message to be conveyed to the target, making it easier to digest (Listiyani & Widayati, 2012). Comic learning media can influence conceptual understanding and can

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improve student learning outcomes. It is reinforced by previous research results showing that comic learning media on protists, digestive systems in humans, and ecosystems can improve student learning outcomes (Danaswariet al, 2013; Damopolii, 2018; Aborryet al, 2018). In its development, comic media in learning has wide varieties according to learning needs. On the other hand, only a few researchers have developed comic-based media green education as a learning medium (Su'udiyah & Tirtoni, 2018). Green education is an alternative educational concept that is community-based and aims to provide environmental knowledge and will eventually give birth to positive behaviour towards the environment (Pertiwi, 2017).

Draft Green education in this study refers to integrating the concept of natural resource conservation outlined in coral reef comic teaching materials. Integrating material on coral reef ecosystems in comic media is very necessary because it is one of the superior resources of the Indonesian nation (Amin, 2009) and local wisdom, especially in the Province of West Nusa Tenggara (NTB). According to Utami & Dewi (2017), utilising local potential in science learning is an alternative to fostering 21st-century abilities in students. A conceptual understanding of ecosystem Coral reefs is needed in the 21st century. Besides the very important economic and ecological functions (Ramadan et al., 2016; Jobet al, 2018), coral reef ecosystems face a long series of threats such as overfishing, coastal development, runoff from agriculture, and shipping (Usmanet al, 2017) which can be damaging ecosystem Coral reefs. Therefore, steps are needed to foster students' understanding of coral reef ecosystems as a model for natural resource conservation. One way to do this is to pack the material ecosystem coral reefs into comic-based teaching materials for green education.

The results of previous research revealed that the implementation of coral reef comic media could improve high school students' environmental care attitudes (Sukriet al, 2020a), the conservation attitude of elementary school students (Sukriet al, 2020b), and understanding of elementary students' concepts (Sukriet al, 2020c). The results that have been achieved do not yet describe the impact of implementing comic materials on coral reef ecosystems comprehensively, so other empirical evidence is needed that can describe the results of implementing green education-based comic materials for all levels of education, namely junior and senior high schools. This article describes the results of implementing comic-based teaching materials in green education and their influence on junior high school students' conceptual understanding in Sumbawa Regency, West Nusa Tenggara.

RESEARCH METHODS

This type of research is a pre-experimental design with a planned one-group pretest posttest design (Campbell & Stanley, 2015). The population in this study were all junior high school students in Sumbawa Regency. At the same time, the research sample was class VII students at SMPN 1 Lenangguar and SMPN 4 SATAP Lenangguar, which were taken randomly with a total of 41 students. Both experimental schools were given a pretest, after which it was given treatment using learning tools, namely coral reef comic media and a posttest. The instrument used is a test to measure students' understanding of concepts. To determine the effect of the implementation of teaching-based is used N-gain (Hake, 1998) with

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the following criteria: $g \leq 0.3$ (low), $0.3 < g \leq 0.7$ (moderate), and$0.70 < g \leq 1.00$ (High), while to find out differences in understanding the concepts of SMPN 1 Lenangguar students and students of SMPN 4 SATAPLenanguar software-assisted sample t-test analysis was usedSPSS 21 for windows. The research design is described in Table 1.

Table 1. Research Design

Subject	Pretest	Treatment	Posttest
A	P1	X1	P2
B	P1	x2	P2

Information:

A : SMPN 1 Lenangguar
B : SMPN 4 One Roof Lenangguar
P1 : Pre-Test
P2 : Post-Test
X1, X2 : Teaching Materials based green education

RESULTS AND DISCUSSION

This study aims to describe the effect of implementing comic-based teaching materials in green education on students' conceptual understanding and describes the differences in the results of junior high school student's understanding of concepts in Sumbawa district, West Nusa Tenggara. To determine the effect of comic-based teaching materials in green education on students' understanding of concepts is carried out N-gain, presented in Table 2.

Table 2 Analysis Summary N-gain

School name	N-gain	Category
SMPN 1 Lenangguar	0.4	Currently
SMPN 4 SATAP Lenangguar	0.5	Currently

The results of this study indicate that implementing comic-based teaching materials in green education affects students' understanding of concepts in the two experimental schools. It is proven by increasing students' understanding of concepts before and after treatment using comic teaching materials with valueN-gain consecutively amounting to 0.4 and 0.5 with the medium category. Value N-gain can be used as a basis for knowing the effect of the independent variables on the variables tested (Rahmawati & Melisa, 2016)—the implementation of comic-based teaching materials in green education on students' conceptual understanding allegedly for several reasons. First, comic media uses language that is interesting and easy to understand so that it can provide positive messages to students. It can trigger students' curiosity to read comics. According to toWahyuningsih (2012), Comics is a great message tool. Messages will be received by students (students) if the message conveyed is

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clear, coherent and exciting. Visual factors from the comic media can cause students' interest in reading comics used in appearance, presentation of material and images that support each other (Afifah et al., 2018). It allegedly influenced students' enthusiasm for reading material in comics, thus increasing students' understanding of concepts related to the material presented.

Second, comics have designs and illustrations that students can understand. Attractive designs and pictures motivate students to read and understand comic content. It follows the findings of Untari & Saputra (2016) that comic media with attractive visuals makes students feel unsaturated in reading activities. So that increases the enthusiasm of students' enthusiasm for reading the comic. The choice of design and use of language in comics, plus graphic illustrations, makes comics an option to help carry out the learning process to achieve the learning objectives. The image used in comic media is the most important element because an image in a comic can convey a message to the reader so that it can be understood easily. Images displayed in comic media must show the material inside comics in a simple way so that they can be understood easily, which can generate interest in student learning. Good interest in learning will encourage students to carry out learning activities, resulting in increased learning achievement. This opinion is supported by Purnamaet al (2015), who found that digital comic media affected students' science learning achievement.

After finding the influence of comic-based teaching materials in green education on students' understanding of concepts, hypothesis testing was carried out to determine whether there were differences in students' understanding of concepts in the two experimental schools. Before analysing the free sample t-test, the prerequisites for homogeneity and normality of the data were analysed. The results of the analysis of homogeneity and normality of the data are shown in Table 3. The analysis results in Table 3 show that the data is distributed normally and has a homogeneous variant as evidenced by the probability value (p) based on the Kolmogorov-Smirnov and Levene tests, which is greater than 0.05 with a value of 0.200; 0.157; and 0.578.

Table 3. Summary of Normality and Homogeneity Tests

Concept understanding	Normality Test (Kolmogorov-Smirnov)			Homogeneity Test (Levene test)		
	Statistic	df	Say	Levene Statistic	df	themselves
SMPN 1 Lenangguar	0.119	22	0.200	0.315	39	0.578
SMPN 4 SATAP Lenangguar	0.169	19	0.157			

Table 4. Summary of the results of the t-test of students' understanding of concepts in the two experimental schools

Variable	t	df	Mean difference	Std. Error difference	Say (2-tailed)
Concept understanding	-.938	39	-3.41627	3.64203	.354

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After the prerequisite tests for normality and homogeneity of the data were met, a free sample t-test analysis was performed to determine differences in students' understanding of concepts in the two experimental schools. The results of the t-test analysis are shown in Table 4. The analysis results in Table 4 show no difference in students' understanding of concepts in the two experimental schools that were treated using comic-based teaching materials. Green education with a value probability greater than 0.05, namely 0.354 (table 3).

Based on the analysis of the results (table 4), the t-test is known that students' understanding of the two experimental classes is the same. The results obtained are presumably influenced by two factors, namely (1) students' initial understanding and (2) familiarity with the material that is oriented towards environmental conservation. Based on the results of observations, it is known that students' understanding of coral reef ecosystems in the two experimental schools is at the same level of understanding, meaning that students in both schools have the same level of initial understanding. It is what is thought to cause the understanding of concepts in the two schools to be the same. According to Setiawan (2011), initial abilities affect learning outcomes and higher-order thinking skills because understanding concepts is at a tiered and sequential level. An individual will more easily understand concepts if the basic concepts underlying these concepts have been well mastered. The same was also reported Astuti (2015), which revealed that students' initial understanding could affect student achievement.

The second factor causing the absence of differences in students' understanding of concepts in the two experimental schools was the habituation of environmental conservation-oriented materials. The observations showed that material on coral reef ecosystems packaged into comic media had never been given to the two experimental schools. It is the cause of the absence of differences in students' understanding of concepts. Coral reef ecosystem material is still quite foreign to students. Apart from environmental factors that are far from the ocean, it is also due to a lack of habituation which ultimately affects students' understanding of concepts. It follows the opinion of Novitasari and Leonard (2017), who said that students' learning habits and routines affect students' conceptual understanding of the material.

CONCLUSION

This study's results indicate an effect of green education-based learning devices on understanding the concept of SMPN 1 Lenangguar students and students of SMPN 4 SATAP Lenangguar, as evidenced by the N-gain values of 0.4 and 0.5, respectively, which are in the medium category. In addition, this study's results also revealed no differences in students' understanding of concepts in the two experimental schools ($p = 0.354 > 0.05$). These results indicate that teaching materials based on green education must be continuously implemented for students.

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