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The Development of Environmental Pollution Module by Implementing *Laskar Kalpataru* Program to Improve Environmental Care Attitude of The Students

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Abstract

The developed module is a module that implements the Laskar Kalpataru program aimed at knowing the eligibility of the module as an effort to improve environmental care attitudes, knowing the increasing of students' independence in learning, and knowing the effectiveness of the developed module in improving student learning outcomes. By using research and development (R&D) method, the results of this study indicate that the module are appropriate to be used in accordance with the eligibility criteria of the National Education Standards Agency (BSNP). It is in accordance with the phase I assessment of getting "yes" answer on all aspects in the questions. In the second phase of assessment, an average percentage of content eligibility is 92.97%, the language eligibility is 90.83% and the presentation component is 90.3%. The application of module is effective to improve student learning outcomes and improve the environmental care attitude.

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INTRODUCTION

The development of the nation's character has been pursued through character education both in schools and universities that is known as character education. Integration of character values in learning starts from learning planning, learning implementation to evaluation. Therefore implementing these values into something important to do. It is in accordance with what was conveyed by Chotimah (2011) that in the education system, character building can be done both macro and micro in the form of teaching and learning activities in class, daily activities in the form of educational units, co-curricular and or extracurricular activities as well as daily life in home, and in society. The results of research by Khusniati, M (2012) with the title "Character Education Through Science Learning" also states that national commitments on the need for character education can be implemented with the integration of character education in learning, one of which is Science learning. In the process of implementing character education two methods are carried out, namely intracuricular and extracurricular (Binti, 2015).

As one of the indicators of the achievement of character education development, and in line with the vision and mission of SMP Negeri 6 Pekalongan, which includes an environmental friendly school program that optimizes the potential of students, schools need to form a forum for extracurricular student activities called *Laskar Kalpataru* as one of the activities extracurricular activities that are specifically engaged in saving and caring for the environment formed in collaboration between SMP Negeri 6 Pekalongan and the Pekalongan City Environment Agency. Emphasis on environmental issues, trash management, and biodiversity conservation. Nikki's (2009) research results entitled "Impact of Extracurricular Activities on Students" states that students who participate in extracurricular activities generally have many opportunities to participate and have better grades, have higher standardized test scores, have more regular schools, and more self-concept because often learn skills such as teamwork and leadership. Activities in the *Laskar Kalpataru* aim to shape the young generation in this case students to always care about the environment around them. Character education should also be integrated into learning in each subject (Prasetya & Rivasshinta, 2011). Learning materials related to norms or values in each subject need to be developed, made explicit, and related to the context of daily life. Education about the environment needs to be taught because the impact of environmental pollution has a global effect. Environmental care character education is expected to instill students' caring attitude towards the environment. The caring attitude is expected to be able to change students' attitudes to be more environmentally wise. Education about the environment can be taught at school, and needs to be taught early on (Novia K, 2013).

In the implementation of character values based on environmental care developed at school, the division of tasks in the *Laskar Kalpataru* program is divided into 6 divisions including: a). Division of environmental hygiene and a healthy culture in which regular classroom hygiene assessments are carried out, mass community service work, b). The garbage bank division includes trash deposit, sorting and storage services, deposit bookkeeping, c). The center division of trash-based creativity includes training on the use of trash into economic objects, creative endeavors, d). The composting division includes training on composting, e). The conservation division includes the activities of the cultivation of family medicinal plants, food plants, fish, and classroom garden competitions. In line with the research conducted by Ani.H (2013) entitled "Improvement of Environmental Care Attitudes Through the Implementation of the Community Science Technology Approach in Class IV.1 Science Learning in Keputran Elementary School " A ", it was conveyed that *STM* (Community Science Technology) approach by implementing stages of actions

could improve environmental care attitude of students so as to achieve the criteria for success in environmental damage prevention and environmental maintenance activities.

Laskar Kalpataru have a vision to strengthen the character of caring for the environment through the environmental rescue movement in the hope that changes in attitudes and behavior of students will occur, so that aspects of attitudes and aspects of knowledge in students are achieved. In the aspect of skills, the focus is on how students are able to utilize and carry out trash processing so that it can be used as a product or work that is useful, which in turn can foster entrepreneurial interest in students. It is in accordance with the results of Dyah M's research (2015) which delivered an example to one *RW* (Citizen Association) in the Cilengkrang village that has an organization that drives its community and cares about trash management based on *3R*. Rapidly increasing population in urban areas has an impact on increasing the amount of trash produced. The increase in the amount of trash that is not followed by the improvement and improvement of facilities and infrastructure for trash management causes the problem of trash to become complex (Aisyah, 2013). Garbage will also cause river pollution. Based on the results of determining the status of water quality, it can be seen that most of the rivers in the Brantas Hulu watershed area have experienced alarming pollution and are an indication of poorer water quality in the downstream (Elvi Y, 2011).

This research focuses on how to improve student learning outcomes in achieving complete learning of Science in class VII students through the development of learning tools in the form of module on environmental pollution. The development of teaching materials in the form of module developed is expected to help students to learn independently while enhancing environmental attitudes, learning outcomes and is expected to also foster entrepreneurial interest in students.

The purpose of this study is to determine the eligibility of the environmental pollution theme module by implementing the *Laskar Kalpataru* program, knowing the increase in student learning independence and knowing the effectiveness of the module developed in improving student learning outcomes. The benefits of research as a learning resource that can increase student knowledge, student learning independence, so that it is expected to improve student cognitive learning outcomes. And it is also hoped that it can be used as motivation for teachers in developing teaching materials.

METHOD

This type of research is research and development (R&D). What is being developed is an environmental pollution module by implementing the *Laskar Kalpataru* program to improve students' environmental attitudes. The population of this research is grade VII students of SMP Negeri 6 Pekalongan. The sample used for research subjects was taken 2 classes from 7 classes with a purposive sample technique, namely class VII E for the control class and VII F for the experimental class.

The development of learning module in this study follows the procedures contained in the development of Sugiyono (2009). The steps consist of: (1) problem identification, (2) data collection, (3) module design, (4) module design validation, (5) design revision, (6) module testing, (7) module revision, (8) field implementation test.

Based on the results of research conducted by Lidman (2010) "Referring to constructivist perspectives, suggests a look at the potential of inculcating alternative teaching methods that encourage students to take a more active role in their own learning and participate in the process of assessing what they are have learned ”which refers to a constructivist perspective, he suggests looking at the potential of instilling alternative teaching methods that encourage students to take a more active role in their own learning and participate in the process of assessing what they have learned. Pebruanti research results (2015) with the title "

Motivation Improvement and Learning Outcomes in Basic Programming Subject Using Module at SMKN 2 Sumbawa" shows that using the learning module can increase student learning motivation and can improve learning outcomes (the value of attitudes, the value of knowledge and practice). Likewise with the results of Arini's (2011) research which states that the development of a module of cells with mind map (MCMM) can improve student learning outcomes compared to students who do not use module. So that with the environmental pollution theme module by implementing the *Laskar Kalpataru* program developed it is expected to improve student learning outcomes in order to achieve minimum completeness criteria (*KKM*). The fundamental problem in the implementation of the development of innovative creative teaching materials based on local potential in learning in the field lies in the problem of limited understanding of knowledge in creating and developing teaching materials creatively and innovatively by exploring the potential of local resources (Nurul Z, 2016).

Therefore the development of an environmental pollution module by implementing the *Laskar Kalpataru* program can be used as an alternative teaching method to improve environmental attitudes towards students. In accordance with Rachmat research. (2009) with the title, "Implementing Environmental Ethics through Schools of Care and Environmental Cultured" which states that environmental education in the school environment is the basis for the formation of environmental ethics across generations.

RESULTS AND DISCUSSION

This research is a research development module on environmental pollution by implementing the *Laskar Kalpataru* program including content validation, language and module presentation, student questionnaire responses, student learning outcomes, assessment of environmental attitudes, and student entrepreneurial interests. Research and development continue to be carried out in various parts of the country to create new findings to prevent underdevelopment (Sudirman, 2018). In order to get maximum results it is necessary to

have a strong desire to implement the 2013 curriculum (Kemendikbud.2013). Learning by using module has several characteristics, namely

independent learning, learning the recognition of individual differences, the occurrence, structure and structure of knowledge, the use of multimedia, active student participation, direct reinforcement of student responses, and evaluation of student learning (Sungkono, 2009).

The eligibility of the environmental pollution module developed comes from an assessment instrument according to the National Education Standards Agency (BSNP) assessed by experts. The eligibility of the environmental pollution module is validated by experts which include the appropriateness of the content, language, and presentation in advance. The environmental pollution module is said to be suitable for use in learning if a score of 62.50% <score <81.25%, while it is said to be very eligible if a percentage of 81.25 <score <100% is obtained. The results of expert and teacher validation assessments can be seen in Table 1.

The results of the assessment instruments according to the BSNP show that the pollution module by implementing the *Laskar Kalpataru* program is very eligible to use in Science learning because it meets the BSNP eligibility criteria. This can be seen in the results of the module eligibility assessment which shows very good results.

In the first phase assessment, there was no suggestion from experts and teachers for revision so that it could proceed to the eligibility assessment of the Phase II module. The module assessment in phase II also consists of three components, namely the content component, the language component, and the presentation component. Phase II module evaluation for each component was assessed by

four people, from 2 UNNES lecturers and 2 Science teachers at SMP N 6 Pekalongan. Each component consists of several aspects which contain evaluation points. The results of the module eligibility component by the experts are explained as follows.

Table 1. Validator Assessment Results on Content, Language and Presentation Eligibility

No.	Validator	Validation 1		Validation 2	
		Average percentage (%)	Criteria	Average percentage (%)	Criteria
1	Content	100	Veryelig	79.69	Eli
2	Content	100	Veryelig	100	Ve
3	Content	100	Veryelig	92.19	Ve
4	Content	100	Veryelig	100	Ve
5	Language	100	Veryelig	76,67	Eli
6	Language	100	Veryelig	100	Ve
7	Language	100	Veryelig	86.67	Ve
8	Language	100	Veryelig	100	Ve
9	Presentati	100	Veryelig	76.90	Eli
1	Presentati	100	Veryelig	98,10	Ve
1	Presentati	100	Veryelig	86.50	Ve
1	Presentati	100	Veryelig	100	Ve

Components of Content Eligibility

The assessment of the eligibility component of the contents of the module in stage II is carried out after the module is declared to have passed the assessment in stage I. The eligibility assessment of the contents of the module is intended to assess the six aspects, which include material coverage, material accuracy, materiality, stimulating curiosity, containing contextual insights and containing entrepreneurial insights. The six aspects contain seventeen points of assessment that have received positive responses by experts.

The average score for the whole component of content eligibility reached 3.74 with an average percentage of 92.97% which is included in the very eligible criteria according to BSNP. The results of the overall component of content eligibility were obtained from four validators consisting of two material experts and two teachers with an average component content eligibility instrument.

Expert I gives an average of 79.69%, Expert II gives an average score of 100%. Teacher I gave an average of 92.19% and Teacher II 100%. It can be concluded that the component of the eligibility of the content or material in the environmental pollution module by implementing the *Laskar Kalpataru* program is said to be very good and eligible to be used in accordance with the provisions stipulated by the *BSNP*. Expert judgment on the component content or material can be seen in Table.1. Ratings from experts show different scores, it is because each expert has a different argument on each point.

Expert I and Expert II considered that the material contained in the module was sufficient and there was no need to be repaired only that Expert I gave advice to improve the background color of the cover to make it more interesting, make a simpler concept map and provide examples of more weighty problems. that is, reproduced types C2 and C3, reference material refers to a standard source with examples of recency in accordance with daily life, conveyed membership of Laskar Kalpataru extracurricular participants and their activities, Student Worksheets (*LKS*) so that it is adjusted to daily reality. Suggestions from the material experts are then followed up to be revised until the material experts state that the module developed are declared to be suitable for use.

Components of Language Eligibility

The linguistic component consists of seven aspects, namely conformity with student development, communicative, interactive, straightforward, thought flow lines, use of terms and symbols / symbols and conformity with correct Indonesian language rules. The seven aspects contain fifteen points of assessment that have received positive responses by experts. The average score for all components of language eligibility reached 3.63 by reaching an average percentage of 90.83% which is included in the very eligible criteria according to BSNP. The average overall results of the language eligibility component were obtained from two language experts and two teachers with an

average language worthiness component instrument.

Expert I gave an average of 76.67% and Expert II gave an average of 100%. Teacher I gave an average score of 86.67% and Teacher II gave an average score of 100%. So it can be concluded that the language eligibility component in the Environmental Pollution module by implementing the *Laskar Kalpataru* program is said to be very good and eligible to use, in accordance with the provisions stipulated by the *BSNP*. Expert judgments on the language component can be seen in Table 1. Ratings from experts show different scores, it is because each expert gives a different score on each item.

Based on the assessment of linguists, it is known that the scores obtained in each aspect range from 3 to 4. Not all aspects that score 3 are improved. Improvements are made based on suggestions and input provided by language experts. Expert I and expert II considered that the language in the module was good enough, but expert I gave suggestions for making improvements on the use of punctuation, writing sentences on questions, writing module should pay attention to enhanced spelling (*EYD*), giving year of picture quotations which can show the updated value of the source / reference and the provision of sentences that refer to each table to make it easier to understand.

Components of Presentation Eligibility

The presentation component consists of three aspects, namely presentation technique, supporting presentation of material, and presentation of learning. These three aspects contain fourteen points of assessment which have received positive responses from experts. The average overall results of the presentation eligibility component were obtained from validation by two presentation experts and two teachers with the average presentation component eligibility instrument.

Expert I gave an average of 76.9%, Expert II gave an average of 98.1%, Teacher I gave an average of 86.5% and Teacher II gave an average of 100%. The average score for the whole presentation eligibility component reached 3.62 with an average percentage of 90.30% which is included in the very eligible criteria according to *BSNP*. So it can be concluded that the eligibility component of the presentation in the Environmental Pollution module by implementing the *Laskar Kalpataru* program is said to be very good and eligible to be used without revision, in accordance with the provisions stipulated by the BSNP. Expert judgments on the presentation component can be seen in Table 1. Judgments from experts show different scores, it is because each expert gives a different score on each item.

Based on the evaluation from the presentation experts, it is known that the scores obtained in each aspect range from 3 to 4. Not all aspects that score 3 are improved. Improvements were made based on suggestions and input provided by the presentation experts. Both expert I and expert II considered that the presentations in the module were quite good. Expert I provides suggestions in writing the module must be consistent in writing a bibliography and sub-materials.

Expert II gives a suggestion that the images used in the module are better to use personal documentation, but not all images used use personal documentation but take from the internet it is because the images are more interesting and clear. Based on these suggestions in this study, an attempt was made to make improvements in the section suggested by experts so that the module developed was declared to be suitable for use.

Eligibility in the module in addition to being determined in the expert assessment is also determined from students' responses to the use of module that implement the *Laskar Kalpataru* program. The response questionnaire included 12 statements and students answered yes or no, giving their reasons. The results of the data taken during the trial, students all answered yes with a positive response to the module. As for the module readability test data covering 4 aspects of questions about the module content, linguistic, presentation, and

the *Laskar Kalpataru* program show an average percentage of 100%. According to students teaching material in the form of module developed is something interesting and can add to the learning reference because equipped with good pictures, and the contents of the material are easy to understand. According to students also the module with the implementation of the *Laskar Kalpataru* made students understand how important the attitude of caring about saving the environment against pollution is getting worse, so students can associate with the teaching of Science in schools and can apply it in everyday life. Thus the environmental pollution module by implementing the *Laskar Kalpataru* program that was developed can be declared passable and can be used.

The effectiveness of the Science module on environmental pollution by implementing the *Laskar Kalpataru* program was obtained from pre-test data, post-test scores, classical completeness results and observation sheets of students' skills and attitudes during learning. The environmental pollution module by implementing the *Laskar Kalpataru* program is declared effective if the use of the module as a supplement to teaching materials can improve student learning and independence.

The environmental pollution theme module developed was able to improve student learning outcomes as evidenced in the analysis of student learning outcomes calculations during field implementation tests in Table 2.

Table 2. Student Learning Outcomes of Field Implementation Test in Class VII F

No	Information	*Pre test*	*Post test*
1	Number of students	39	39
2	Average score	80,51	94,62
3	Lowest score	45	100
3	Highest score	90	100
4	Number of completed students	33	39
5	Number of uncompleted students	6	0
6	*N-gain*	0,6	
7	Criteria of *N-gain*	Medium	
8	t_{table}	0,681	
9	$t_{counted}$	18.92	
10	Criteria of *t-test*	Significant	

The effectiveness of the application of the developed module can be seen from the results of student learning and independence. Learning outcomes and student independence are students' abilities that are important in understanding material both learning that is done with the teacher or not. The Science module on environmental pollution themes developed is expected to be one of the teaching materials that has a role in improving student learning outcomes and independence in the learning process, especially Science subject.

The effectiveness of the application of the Science module on the theme of environmental pollution by implementing the *Laskar Kalpataru* program was assessed based on the learning outcomes of the application class, class VII F through pre-test and post-test. Before the module is implemented. Students are given the same problem but have random numbers and multiple choices then the results are used as post test scores. Pre-test and post-test results have been obtained, then analyzed further by normality test, homogeneity test, t-test and N-Gain. It is done in order to really know the increase in learning outcomes of the application class. Based on the results of the analysis of the pre-test and post-test learning outcomes it can

be concluded that the average post-test results are better than the average pre-test.

Based on the table it can be seen that the use of the Science module on environmental pollution by implementing the *Laskar Kalpataru* program has an effect on improving student learning outcomes. It is consistent with Mulyanratna's research (2011) which states that by developing module as a way to make 100% of students reach *KKM*.

Student learning outcomes can be obtained not only from pre-test and post-test scores but also from individual assignments and group assignments. The value of the assignment is averaged and then combined with the posttest value in order to obtain the final grade.

Students can be said to have finished learning if the final grade of each student reaches the *KKM* set in this study by 75. The number of students who have completed learning for the application class is 39 children so that the percentage of classical completeness for the application class VII F is 100%. The percentage value can be said that student learning outcomes using the pollution theme module by implementing the *Laskar Kalpataru* program can achieve classical completeness. It is in accordance with Dewitt's research results (2013), which states "Matching learning style strategy with certain technology will be able to increase students learning experience" ie matching learning style strategies with certain technologies will be able to improve student learning experiences. The results of Misbahul J's (2013) study entitled "Impact of Environmental Education Kit on Students" stated "Using descriptive and inferential statistics it was determined that there was asignificant difference in the level of environmental literacy based on gender, whereas for class stream reveals nosignificant difference . He said that by using descriptive statistical data and inference there were significant differences in environmental literacy if based on gender, while there were no significant differences if based on grade levels.

The final grades of students in this study are not only the cognitive aspects that are assessed but the assessment also emphasizes the affective and psychomotor aspects proportionately. As stated in the 2013 curriculum that the assessment of student learning outcomes at the level of primary and secondary education is based on the principles of authentic assessment whose assessments are carried out comprehensively to assess the realm of attitudes, knowledge and skills.

CONCLUSION

The development of the Science module on the theme of environmental pollution by implementing the *Laskar Kalpataru* program that was developed is suitable for use in accordance with the eligibility criteria of the National Education Standards Agency (BSNP) and as an effort to improve environmental awareness and entrepreneurship interests in grade VII students. Learning by using module has several characteristics, namely independent learning, learning the recognition of individual differences, the occurrence, structure and structure of knowledge, the use of multimedia, student active participation, direct reinforcement of student responses, and evaluation of student learning. The application of the Science module to the theme of environmental pollution by implementing the *Laskar Kalpataru* program which was developed effectively to improve the value of learning and environmental attitudes towards students. It is evidenced by the positive student responses after using the module.

From the results achieved in this study, the need for the involvement of teachers who are always innovative creative in maximizing the potential of students is to give real examples in making projects related to environmental problems.

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