Evaluation of environmental based geography instructional model in high school

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Abstract. The environment has a role in human life. Learning in schools should introduce students to environmental awareness. The goal is for students to keep the environment sustainable. In research on the geography instructional model has the purpose of conducting a test of product one to one evaluation, small group evaluation, and field triall evaluation. The evaluation product model was conducted in high school in Surakarta. The result of a product test is that the environment-based geography instructional model is effective for creating a fun learning. During the test the product can be concluded that students are highly motivated when invited to study geography by discussing environmental issues.

1. Introduction

Geographical subjects are considered less interesting. Many students consider that geography is a more memorizing lesson. In curriculum 2013 there is a change in geography subjects. Geography is a subject of interest. This causes students motivation to geography learning to be lower. From an early stage in the planning, emphasis was put on the need for students to be engaged actively in their learning [1]. The result of a need analysis for high school students in Surakarta showed that many students were not interested when studying geography in class. The main cause is not on the geographical subject matter, but on the application of the instructional model. Teachers still use expository models to teach geography. Expository models are prioritizing the application of lecture methods. If applied in geography learning without variations, it will cause the students not to be motivated to catch attention. Students will be easily bored and sleepy when the geography learning process occurs. Student modeling and context modeling play an important role in adaptive and smart learning systems, enabling such systems to provide courses and recommendations that fit students characteristics and consider their current context [2].

Actually we cannot conclude that the expository learning model is not appealing. We must admit that there is a lesson material that is appropriate to use expository learning models. The power of intonation and the exactness of choosing words are primary capital using learning models that are dominated by lecture methods. However, the learning practice that is widely encountered in the classroom is an expository learning model. From the teacher side, application of expository model that prioritizes lecture method is very easy. From the student side, an expository model if given without variations does make students not spirit. If geography learning is performed during the day, it is definitely a big problem for uncreative teachers. Obviously by using interesting learning models, geography learning will be able to follow students happily, passionately, and not sleepy. A geography teacher should be able to connect between the functions of geography lessons in relation to social, economic, and environmental issues [3]. In addition, a geography teacher should be aware of the characteristics of the students learning style, in order to provide proper learning treatment. Learning
style refers to a cluster of psychological traits that determine how an individual perceives, interacts with, and responds emotionally to learning environment [4]. From that background, researchers created an environment-based learning model. Researchers deliberately used the environment as a basis in the development of this geography learning model. The reason is that since 2007 in fact teachers have been required to involve the environment as part of learning. Learning assessments should consider students awareness of their environment. The learning-oriented assessment environment is characterized by classroom assessment practices that enhance student learning and mastery of subject materials such as asking students to do a variety of the meaningful assessment tasks with moderate difficulty, providing them chances to improve their task performance, and giving them informative assessment feedback [5].

Our environment both land, air, and ocean have been heavily damaged. One of the awareness that can be done from the beginning is the application of environmental based learning models. The environment is intended to include natural environment, social environment, and cultural environment. The natural environment is related to how students are able to appreciate the universe, including preserving the preservation of various plants in the surrounding environment. The social environment relates to how students are able to have social sensitivity in people's lives. Students must have a high social attitude, for example in community activities in his home environment. A related cultural environment about how students are able to appreciate cultural transformation. This is the most high learning achievement. Become a cultured man who is able to humanize humans. Researchers are trying to design appropriate learning models for use in geography lessons. Researchers are using the environment as a basis for development because humans must always side with the environment harmoniously. In some cases, sometimes teachers are not able to demonstrate environmental problems directly to students.

The development of this learning model also uses video to address these limitations. Video is a potential window that can expose the minds and heart of many rural African children to modern agricultural practices and environmental concepts, far more than the traditional classroom teacher can achieve [6]. The above excerpt can be concluded that the learning video is very potential to portray the heart and mind of the community somewhere, so that its activities can be observed. To make learning videos is not a difficult activity for teachers. In the 21st century, with technological advances, almost everyone has a smartphone with a wide selection of applications and features to record an event. The editing process of almost professional class can be obtained on the smartphone application, so this is the reason why the learning video is the most important part of the environment based geography learning model. Not necessarily teachers who always make learning videos. Teachers can collaborate with students as part of their assignments in the learning process. However, keep in mind is that designing learning videos should still take note of the design rules of good learning messages. This is arranged by Pustekkom, so the rules of media development must be understood by the teacher.

2. Methods
The methods used in the development of this environmental-based geography learning model used the Research & Development model. The study used a combination of the Borg & Gall development model adaptation [7] and Dick & Carey to produce a geographic learning model. Trial product model, used three phases, namely one to one evaluation, small group evaluation, and field trial evaluation. The product trial process can be seen in Figure 1.
Figure 1. Flowchart of Product Trial Process

In the one to one evaluation phase, researchers used five students for the trial. At the small group evaluation stage, researchers used 15 students for the trial. At the field trial evaluation phase, researchers used 31 students. The population in this study was high school students in Surakarta. However, for time efficiency, researchers used a trial base of the Dick and Carrey version which used a one-class sample in high school. In the Borg & Gall model field trials are conducted against students within the scope of one province, while in this research the user of the product is only in the scope of one school. This subject condition is highly permissible even in Dick & Carey model [8]. At the end of three stages of product testing, a test of effectiveness was conducted to determine if the learning model developed was able to help students achieve the prescribed learning objectives. In each phase of the trial is revised product learning model based on input from teachers and students.

Research instruments used in testing one to one evaluation, small group evaluation, field trial evaluation is an observation sheet and product valuation. The instrument uses a Likert scale because researchers use the mode to analyse. The numbers in the Likert scale are only symbols, ordinal in nature, and do not apply to mathematical formulas. The data collected are ordinal, they have an inherent order or sequence, but one cannot assume that the respondent means that the difference between agreeing and strongly agreeing is the same as between agreeing and being undecided [9]. Researchers consider using the mode to analyze the data in this study more valid than by using median or average. Test products in phase one to one evaluation, small group evaluation, and field trial evaluation, conducted to know the effectiveness of product learning model developed. In this test phase, researchers establish focus on the student's appraisal description of the learning model he felt. Researchers want to know more about the responses of students and teachers who use the environment-based geography learning model. The effectiveness of targeted learning models is not just learning objectives, but hopefully changes in learning atmosphere are more enjoyable.

3. Results and Discussion
This learning model development study focuses on model evaluation. The prototype of a learning model that has been declared worthy of the experts is the trial as a condition to be used in schools in a wider range. Test activities to evaluate this product involve teachers and students in high school. Teachers and students are users of product learning models. At the beginning of the activity before the trial began, researchers invited the geography teachers in Surakarta to be given the introduction of environmental-based learning model products to create a fun school. Not all geography teachers are involved in this research activity. Only certain teachers are involved in researchers. The consideration is assuming it already represents the aspirations and needs of teachers in the face of geography learning issues. In a
meeting forum with teachers at the time of test preparation, researchers are striving to provide a comprehensive understanding of environmental-based syntax and learning model procedures to create a fun school. When the teacher understands precisely, it will minimize the likelihood of mistakes in implementing the learning model.

In the testing activities of the learning model products, researchers not only designed the syntax of learning only. Researchers have also developed learning modules as a student's hand when models are applied. Researchers prepared a learning plan that was compiled with geography teachers. The syntax, modules, and learning models are validated first by material experts and model members to be declared worthy.

3.1 One to one evaluation

In the one to one evaluation was performed on high school students as much as five people. The test implementation was done at the end of the lesson hours, so as not to interfere with student learning hours in school. The time used for the trial is a meeting. One meeting consisted of two hours of instruction. The focus of one to one evaluation is aspects of communication, design, curriculum, and learning quality. In the communication aspects, the program structure of the learning model that is done can be followed by students although there are still confusion to understand. The structure of learning programs felt still difficult, so it is necessary to simplified. The exception beginning with the teacher's explanation is felt unappealing to the students. This is evidenced by very low student enthusiasm during learning. Thought logic needs to be well designed, so that learning information is in line with students' cognitive structures. It is worth realizing that the entry behaviour each student is different, so that researchers design a learning model involving the role of environment. Social, natural, and cultural environments are already known to students. Based on observations during the learning process, student interactions have not been maximized. Researchers concluded that the cause of students interactions is not maximally because it is still on one to one evaluation that the number of students is limited to five people. Teachers who teach on the trial one to one evaluation are already using contextual learning media, with the introduction of actual examples of problems. The language used is also easy for students to understand.

In the design aspect, in this one to one evaluation trial activity has been designing the learning media by adjusting the rules of the design of learning messages. Creativity in delivering learning messages by involving environmental problems is good enough, just need improvement. This is done because there are two students who give input that they feel the challenge to think critically in geography learning. In this aspect of the curriculum, in this one to one evaluation test, the teacher has delivered the learning objectives at the beginning of learning. Out of the five students who made the test samples did not comment, it means that students do not mind the target of the learning objective to be achieved. Although the material structure has been compiled by researchers sequentially, but there are still 3 students who are still struggling to develop thinking skills from basic, critical, to creative. The evaluation of pretests and postest learning has not been satisfactory. After this one to one evaluation test, researchers had to revise some of the sections to be presented in the wider next test. In the learning quality aspects, the preparation of the subject matter is in accordance with these competencies and basic competencies. However, at the time of one to one evaluation, researchers concluded that for the next test, it is necessary to develop a simpler competency achievement indicator. Simplification of the competency achievement indicator is done to facilitate the students to reach the learning objectives.

3.2 Small Group Evaluation

At the small group evaluation carried out by involving teachers and high school students in Surakarta. At the trial stage, researchers used 15 students. The implementation of small group evaluation is conducted as many as 2 hours. The trial of the second stage was done differently from the previous trial. The trial was done in the morning, because researchers followed the time given by the school. The school adapts to a geographical course schedule at school. In essence, small group evaluation test is done based on the improvement of one to one evaluation test. Advice from teachers and students when
the first test is used as a material improvement. The results of the refurbishment were used for this second phase of trial. The focus of small group evaluation is the same as in previous trials, namely communication aspects, design, curriculum, and learning quality.

In the communication aspect, the structure of the environment-based geographical learning model program has been easily understood by teachers and students. Students feel the ease of learning from the end to learning. The logical thinking of students in this second stage test looks better than the previous trial. The ability to think critically about the problems submitted by the teacher is good. The cognitive structure of students becomes the attention of researchers, in order to learn information as new knowledge, easy to understand students. The higher order thinking skills of students began to be seen in the trial small group evaluation. Students have a high motivation to follow the learning process. The skill of asking students from simple to complex appears in the learning process in this second test. Based on a revision of one to one evaluation test results, researchers added enrichment materials and case studies to the learning module. Researchers also insert ice breaking methods in the syntax of learning models. The addition of ice breaking method with the aim of increasing interaction between students in learning.

In the design aspect, in the test activities small group evaluation using the addition of geospatial media in the form of maps and aerial photographs. The learning model developed is easier to apply with the help of topographical map media and panchromatic aerial photographs. Researchers observed that by using geospatial media assistance, environmental based learning models are more effective. The aerial photographs used are colorful and black-and-white panchromatic aerial photographs. The use of panchromatic aerial photographs is easier for students to understand because they are similar to prints from ordinary cameras in general.

In this aspect of the curriculum, the implementation of the learning model in this second test has little change. The change is in the initial learning action, delivery of objectives using the mind map method. This step is done as an improved answer from the one to one evaluation. Through the mind map method, students feel involved in determining what objectives will be accomplished through the process of learning. Critical thinking skills are easy to apply when students are engaged from the beginning in conveying learning objectives. However, at the trial of small group evaluation, critical thinking skills are seen in the students. Researchers still need to design developed learning models to achieve higher thinking skills. This is due to the demands that students should be able to perform high-level thinking skills. Higher order thinking skills not only stop at critical thinking skills. This is what is the material improvement for the next stage trials.

In the quality of learning, the preparation of learning procedures in small group evaluation activities has been adapted to the core competencies and basic competencies that have been established by the curriculum, especially in geography subjects. The competency achievement indicator is rearranged based on the observation results of the previous trial. Competency achievement indicators are prepared with regard to proper operational verb usage. The operational verb used should be measured for success and is arranged hierarchical from easy or simple. Learning devices are complete enough, but there are advice from teachers at school that learning scenarios are less understandable.

3.3 Field Trial Evaluation
At the test stage field trial evaluation involves one class consisting of 31 students. This last test is the result of improvement of one to one evaluation and small group evaluation. Improvements include implementing procedures, modules, and learning devices. The trials are done in the morning, adjusting the schedule of geography lessons at school. The field trial Evaluation field is carried out as much as 2 hours. On the communication aspect, the program structure of learning model repaired simpler. The exception is designed to be compelling with the help of contextual learning video impressions. This is done based on input when testing small group evaluation, namely students feel the initial activity of the learning boring. High order thinking skills in this last test, not only achieving critical thinking skills. Students have been able to achieve creative thinking skills. This is because the modules used are equipped with interesting case studies that foster students curiosity.
In the design aspect, in this field testing activity trial evaluation, not just utilize the map and aerial photographs as a learning media. In the syntax of the learning model is given the addition of aerial photographs delineation activity, so it can be a learning output. In the curriculum aspect, the challenge raises creative thinking skills already answered. Students are not only able to perform reflections on the problems given by the teacher, but are able to perform the analysis that produces the original product. Original products produced by students are ideas or opinions, and group and individual work. In this final test, a revision of the environment-based geography learning model is capable of delivering a good stimulus to the students for productive creative thinking. In the quality of learning, in the last test is not much different from the trial small group evaluation. There are no feedback suggestions regarding learning devices. The competency achievement indicator has been arranged hierarchical from simple to complex with proper operational verbs. The operational verbs used can also be measured in success.

4. Conclusion
The environment-based geography learning model that has been through the 3 test phases of one to one evaluation, small group evaluation, and field trial evaluation is stated to be effective for use in the learning process. In each stage of the trial, researchers get advice and feedback from teachers to improve the learning model developed. Researchers are also trying to listen to students’ responses after following the learning process at each test stage. Through the information of the teachers and students as well as the observation results from the researchers, the material is very important improvement. Improved learning models include learning syntax, modules, media and learning procedures.

This environmental-based geography learning model is well-deserved and effective for creating a fun learning process. Learn any, the main key is fun. If students are happy then the learning process can be comfortably followed without pressure. The learning model of this development results can be applied in geographic subjects everywhere. It should also be adjusted to the students’ characteristics and the school’s condition.

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