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Developing geography subject teaching materials oriented to critical, creative, collaborative, and communicative skills (4C), higher order thinking skills (HOTS), and Literation Culture

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Abstract
This study aims to develop Geography teaching materials oriented to the ability to think critically, creatively, collaboratively, and communicatively. Thus, the materials can improve higher order thinking skills (HOTS) and develop the culture of literacy. In preparing the development of this geography teaching material, researchers paid attention to the quality of design, media, and content of teaching materials. The results of the study were reviewed by design experts, media experts, content experts, and the results of the students' trials generally showed a score of 91.45% with a very good predicate, with details (1) the result of the design expert review was 89.23%, (2) the result of media expert review was 94.29%, (3) content review result was 95%, (4) students' responses to teaching materials obtained a score of 87.41%. In addition, the result of the trial of the use of teaching materials showed that the average students got a score of 79.7. By paying attention to the results of expert reviews and student responses and the results of the trials, it can be concluded that the developed teaching materials were very good, and could foster ways of thinking critically, creatively, communicatively, and collaboratively for students and could train students to have higher order thinking skills (HOTS) and could improve the culture of literacy. Therefore, it is recomended that the instructional material developed could be applied in the learning process.

Keywords: critical thinking, creativity, communication, and collaboration, higher order thinking, literacy culture

1. Introduction
To facilitate the teacher in presenting teaching material in the learning process and make it easier for students to learn it, teachers need to organize teaching materials that have been developed into teaching materials. The instructional material in question certainly does not merely facilitate understanding of the material concept, but more than that it is able to analyze the existing phenomena that are both related to the cause of the occurrence, the effect, the impact, and the projected solutions that can be taken. In short, teaching materials must be able to direct students to think critically, creatively, holistically (collaboratively), and be able to communicate well.

Teaching material used by teachers generally still promotes the students' understanding. Referring to Bloom and Anderson's taxonomy, it will be in the cognitive domain of memory (C1) and understanding (C2). It is true that these teaching materials can be a basis for students in learning a lesson, but in an effort to arouse students' competency in applying a knowledge, doing the process of analysis and synthesis is very important to design teaching materials that encourage students to think critically, creatively, collaboratively, including being able to find solutions to a problem based on rationalization and critical thinking analysis.

Based on the background above, one of the efforts that must be done by teachers to improve the quality of learning is to develop teaching materials. The development of the instructional materials related to the elements of design, material content, and practice questions that can motivate students to think critically, creatively, collaboratively, and communicatively (4C), develop higher order thinking skill (HOTS), and foster a culture of literacy.

2. Theoritical Review
Teaching materials are a set of learning tools or tools that contain learning material, methods, limitations, and ways to evaluate that are designed systematically and attractively in order to achieve the expected goals of competencies or sub-competencies with all its complexity (Widodo & Jasmadi, as cited in Lestari, 2013, p. 1). This understanding explains that a teaching material must be designed and written with the instructional rules because it will be used by the teacher to help and support the learning process. Materials or learning materials are basically "contents" of the curriculum in the form of subjects or fields of study with topics/subtopics and the details (Ruhimat *et al*., 2011, p.152) [12].

Based on the provisions of writing module issued by the Directorate General of Primary and Secondary Education of the Ministry of National Education in 2003, teaching materials have several characteristics; they are self instructional, self contained, standing alone, adaptive, and user friendly (Widodo & Jasmadi, as cited in Lestari, 2013, p.2).

First, self instructional is teaching material which makes students enable to learn by themselves with developed teaching materials. To fulfill the character of self instructional, some objectives must be clearly defined in the teaching material, both the final goal and the intermediate goal. In addition, the teaching materials will facilitate students to learn thoroughly by providing learning materials that are packaged into more specific units or activities.

Second, self contained is all the subject matter of one competency unit or sub-competency that is learnt in one teaching material altogether. Thus, a teaching material must contain all of its parts in a single book to make it easier for the readers to learn the teaching material.

Third, standing alone is the teaching material developed that does not depend on other teaching materials or does not have to be used together with other teaching materials. This means that a teaching material can be used without being dependent with other teaching materials.

Fourth is adaptive. The teaching materials should have high adaptive power to the development of science and technology. Teaching materials must contain materials that could increase the reader's knowledge regarding the times or more specifically the development of science and technology.

Fifth is user friendly. Each of instruction and information exposure that appears to be helpful and friendly to the user, including the ease of the users in responding and accessing as they wish. Hence, teaching materials should be presented to make it easier for readers to get information as clearly as possible.

Broadly speaking, the function of teaching materials for teachers is to direct all activities in the learning process as well as the substance of competence that should be taught to students. The function of teaching materials for students is as a guide in the learning process and the substance of competence that should be learnt. The teaching material also functions as an evaluation tool for learning outcomes. Good teaching materials at least include learning instructions, competencies to be achieved, content, supporting information, training exercises, work instructions, evaluation and response to evaluation results (Prastowo, as cited in Lestari, 2011).

Based on the learning strategy used, the function of teaching materials can be divided into three types; they are the functions in classical learning, individual learning, and group learning (Prastowo, as cited in Lestari, 2011, p. 25-26). The functions of teaching materials in classical learning are (a) as the only source of information as well as supervisors and controllers of the learning process (in this case, students are passive and learning based on their speed of learning something), (b) as supporting material for the learning process. While the functions of teaching materials in individual learning are (a) as the main media in the learning process, (b) as a tool that is used to compile and supervise the process of students in obtaining information, (c) as a support for other individual learning media. Meanwhile the functions of teaching material in group learning are (a) as the material that is integrated with the group learning process by providing information about the background of the material, information about the role of the people involved in group learning, as well as instructions on the group learning process itself, (b) as a material supporting the main learning material, and if it is designed in such a way, it will be able to increase students' learning motivation.

Paulinus (2016) [10] finds that the use of slow motion educational animation teaching materials can improve students' academic and business performance compared to expository teaching methods. Menwhile, a study conducted by Alhomoud (2016) [3] shows that motivation is statistically significant for language learning due to Edmodo's use. It also shows that teacher-student interaction is very significant through Edmodo.

Buchori and Setyawati (2015) [1] conducted a research which aimed to develop a model of character education learning through e-comics in elementary schools. A theory of development used the theory of development modification of Plomp and Borg and Gall utilizing the following steps: (1) this research is literature study or field study (2) design (design and media model), (3) realization/construction (designs of assessment revision), (4) test, evaluation, and revision (hypothetical product improvement), (5) implementation (test the effectiveness of the before and after tests). This study shows the development of the character education model of five phases and tests of the effectiveness of the learning process as indicated by the improvement of the value of students' character through observation and the value of student achievement.

Nugraha (2013) [2] finds that the development of instructional material which meets the criteria of valid, effective, practical, and can improve critical thinking skills. Setiyadi who conducted a research entitled Development of a Biology Learning Module Based on a Scientific Approach to Improve Student Learning Outcomes, states that Biology learning modules based on scientific approaches are valid, practical, and effective. The use of scientific-based learning modules has met the criteria of effectiveness because the test of student learning outcomes has met the classical completeness criteria of 84.21% Budiyasa *et al.* (2013) [4] conducted a study entitled the development of online teaching materials and assessment alternatives for the science lesson in eighth grade of junior high school with Dick and Carey models. The result indicates that there are significant differences in student learning outcomes between before and after the use of online teaching materials.

Kim (2017) [5] shows the ways of how people adapt information and communication technology (ICT). And this research was conducted to study how fast an electronic communication spreads and transforms rural areas in Africa especially the Republic of Zambia. The impact of social networking is used in a dynamic and creative way to not only spread business opportunities but also energize the economy and society. They want to gather information from communities and households to understand the many ways of people adapt this technology.

The use of learning modules supports learning activities (Rufii, 2015) [11]. The collected data was then analyzed using descriptive statistics for quantitative and qualitative data. The results revealed that the use of constructivist learning strategies and learning modules became a necessity.

Krusel and Buckmiller (2015) [6] show the results that the use of a conceptual framework of technology was proven to be useful for investigating the views of prospective administrators related to the use and adoption of technology, and it has the potential to be used and applied in other contexts.

Davoudi (2016) [9] conducted a study comparing audio and text usage. The results show that all participants (100%) agreed that both audio and transcripts (written text) were useful for them and claimed that it was a good method to improve language comprehension.

Raine and Maarika (2016) [14] conducted research on the use of ipad in the learning process. The results of the study show the initial level of students as producers and consumers of information from the point of view of iPad users. This means that the use of ipad in learning could improve students' understanding.

According to Greene and Petty (as cited in Tarigan & Tarigan, 1986) [13], several uses of textbooks are as follows (a) reflecting a strong and modern point of view about teaching and demonstrating applications in the teaching material presented. (b) presenting a source of problems or subject matter that is rich, easy to read and varied, which

meets with the interests and needs of students, as the basis for suggested activity programs where expressional skills are obtained in conditions that resemble the real life, (c) providing a neatly arranged and gradual source of expressional skills, (d) presenting (together with the manual book) methods and means of teaching to motivate students, (e) presenting the necessary initial fixation as well as support the practical exercises and tasks, (f) presenting harmonious and appropriate materials or evaluation and remedial tools.

The research of Figueroa *et al*. (2017) [8] indicate that the inclusion of indigenous knowledge, informal lessons, and place-based instruction in the science curriculum have shown many positive results both in the classroom and in the laboratory. It teaches students some traditional ways to know and connect the concepts of Western science and develop an appreciation for both perspectives that directly strengthens students' knowledge and cultural values.

Teaching materials have various types; some are printed or non-printed. Printed teaching materials are often found as handouts, books, modules, brochures, and student worksheets. The book of Indonesian Language Curriculum Review describes good criteria for textbooks which consist of the following eight criteria: (a) organization and systematics, in term of arrangement (or method of arrangement) of something that consists of components or topics with a specific purpose, while systematics means the rules in textbooks that must be followed by one another, (b) suitability of content with curriculum, (c) suitability of material development with themes/the purpose topics of material development so that the learning materials are easily comprehended by the students, (d) cognitive development, it means that the development of students' cognitive also need to be considered in writing and selecting textbooks, (e) the use of language, the textbooks must meet the criteria of Indonesian language usage that are good and true and keep up with the times, (f) harmony of illustrations with discourse/reading text; it means that textbooks must always be accompanied by illustrations or pictures so that textbooks are attractive to students, (g) moral aspects; it means that morals are also the assessment criteria for textbooks, (h) idioms of regional taboos are languages and dialects that are typical of a nation/region.

3. Research Methods

This teaching material was developed based on the Assure Model. Assure Models are one of the instructions and planning that can help to plan, identify, determine goals, choose methods and materials, and evaluate. This model is a reference for educators in teaching the students in a learning activity; it is planned and arranged systematically by integrating technology and media so that learning becomes more effective and meaningful for students.

A learning activity with the Assure Model has several stages that can help to actualize an effective and meaningful learning for students. These stages are (a) analyzing learners; the main goal in analyzing including educators is to meet the students' urgent needs of learning so that they are able to get the maximum level of knowledge in learning, (b) stating standards and objectives; the second stage in the model is to formulate goals and standards. Thus, it is expected that students can obtain a certain skill and competence from learning. In formulating learning objectives and standards, it is necessary to pay attention to the basis of the right strategy, media and media selection, (c) selecting strategies, technology, media, and materials; The next step in making effective learning is to support learning by using technology and media in the systematic selection of strategies, technologies and media and teaching materials, (d) utilizing technology, media and materials; In utilizing the existing media and materials, some steps should be followed, such as checking the feasibility of teaching materials, gathering all the materials needed by students, preparing the learning environment, showing learning objectives, and focusing learning on giving student experience, (e) requiring learners participation; The main goal of learning is the participation of students in the material and media that are presented. A teacher in the technological era is now required to have experience and practice in applying, analyzing, synthesizing, and evaluating rather than just understanding and giving information to students, (f) evaluating and revising; Assessment and improvement are very basic aspects to develop the quality of learning.

The stages of developing instructional materials are conducted through various steps; they are (a) analyzing core competencies and basic competencies contained in the curriculum, (b) conducting analysis and identification of material, both related to facts, concepts, procedures and meta-theories, (c) conducting studies of existing teaching materials, by evaluating the strengths and weaknesses of each, as a provision to develop teaching materials, (d) arranging representative design of teaching materials; it will be able to arouse students' enthusiasm to think critically, creatively, collaboratively, and communicatively, culturally literate and able to solve using higher order thinking skills (HOTS), (e) preparing teaching materials by considering some aspects of design, material content, and exercises.

The researchers' thinking flow is related to the development of teaching materials; First, evaluating the needs of teaching materials for students. Second, reviewing the existence of good teaching materials concerning the design, content, and media used. In this context, the fact that the teaching materials available are considered to be less representative, both in terms of quality and quantity. Third, developing teaching materials that are able to promote students to think critically, creatively, collaboratively, and communicatively, the development of literacy culture, and the enhancement of higher order thinking skills (HOTS).

The teaching materials developed are tested for students, and reviewed by experts, both experts in the field of design, media, and material content. Through a testing to students, it can be obtained an overview of the weaknesses and strengths of the developed teaching materials. This is certainly as a subtance in improving the teaching materials developed.

4. Result and Discussion

The teaching materials of Geography for grade X of the second semester developed by researchers for learning have been very good and can foster ways of thinking critically, creatively, communicatively, and collaboratively for students and train students' higher order thinking skills (HOTS). This is shown by the results of review conducted by the experts of design, media and content and student responses that show a score of 90.61%. The results of the study of each expert and student responses are as follows:

1. **Teaching Material Design:** Based on the results of the review of design experts in teaching materials, it was obtained a score of 89.23%. Meanwhile, based on the students' responses to the design of teaching materials

showed a score of 85.90%. By paying attention to the results of design expert and the response of students about the design of teaching materials, a mean score of 87.57% was obtained. This means that in terms of design, the developed teaching materials were very good.

2. **Media of Teaching Materials:** Based on the results of the review of instructional media experts, the results were generally obtained at 94.29%. Whereas, based on the students' responses to the media teaching materials showed a score of 87.54%. By considering the results of the reviewer and students' responses toward the media of teaching materials, it was obtained a mean score of 90.92%. This means that in terms of media, the developed teaching materials were very good.
3. **Contents of Teaching Materials:** The review of contents of teaching materials showed a score of 95%. While, the student responses to content of teaching materials showed a score of 91.67%. The mean score of the reviewer and student responses toward contents of teaching materials indicated a score of 93.34%. This means that the instructional materials developed, in terms of the content of the teaching material were very good.
4. **Test results:** The instructional materials developed were able to foster students' ability in thinking critically, creatively, communicatively, collaboratively (4C), develop students' higher order thinking (HOTS0, and improve the culture of literacy. This is indicated by the results of the trial using teaching materials and evaluating with HOTS questions, which were critical, creative, communicative and collaborative. The average score achieved by the students was 79.7.

5. Conclusions and Suggestions

The teaching materials of Geography for grade X of the second semester developed by researchers for the process have been very good very well, and can foster ways of thinking critically, creatively, communicatively, and collaboratively for students and can train students' higher order thinking skills (HOTS). This is shown by the results of review conducted by the experts of design, media and content and student responses that showed a score of 91.45%. The results of the trial of teaching materials for students showed a mean score of 79.7. If it is verified with the criteria for the quality of determined teaching materials, it has a very good quality.

Related to the existence of teaching materials that are still less or not representative, the teachers should always improve the quality of the teaching materials to provide a convenience to the students in learning a subject matter. Teachers are expected to always make every effort to provide high quality of teaching materials which can foster and train students to think critically, creatively, communicatively, and collaboratively as well as use higher order thinking skills (HOTS). The availability of good teaching materials will certainly improve the quality of learning. The teacher's expertise in preparing representative teaching materials is expected to achieve a good quality learning.

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