

CONCEPTUAL MODELS OF LEARNING MATERIAL DEVELOPMENT BASED ON THE SPATIAL PERSPECTIVE

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Abstract— The purpose of this research is to develop a conceptual model of learning material that based on the spatial perspective. The research use development design of the Borg and Goll with eight steps are: need analysis, planning, develop preliminary form of product, preliminary field testing, main product revision, playing field testing, revision of product, and the final product revision. The subjects of the research were student of the SMA 5 Malang. The result of the research shows that to develop learning material that based on the spatial perspective can be done with the following steps: (1) determining the topic of the problem, (2) determining the location and distribution of phenomena or object that is completed by map, (3) explaining the argumentation why phenomena or object occurs at that location, (4) explaining the relation of phenomena or objects that occur with other related natural factors, (5) using spatial analysis in accordance with the objectives.

Keywords— Learning Material, Spatial Perspective, Conceptual Model

I. INTRODUCTION

Learning material is knowledge, skill, and attitude that student must learn in order to achieve a defined standard of competence. In detail, the types of learning materials consist of knowledge (facts, concepts, principles, procedures), skills, and attitudes or values. Learning material can be distinguished over several types. The type of learning materials based on the subject consists of two types. The second types are: (a) learning materials which are deliberately designed for learning, such as books, handouts, worksheet and modules; (b) learning material that are not designed but can be used for learning, such as clippings, newspapers, films, commercials or news. Base the from the function, the learning materials that are designed consists of three types, that is material presentation, material reference, and material self study.

Along with the development of technology, instructional materials also experienced development. The direction of development of learning materials to virtual learning materials with the application of increasingly diverse and dynamic technology. Classifies learning materials into four categories: printed materials such as handouts, books, modules, student activity sheets, brochures, leaflets, wallcharts, photographs, and model. Audio video include cassettes, radio, and audio compact discs. Audio visual such

as video compact disks, and movies. Interactive multimedia learning materials, such as CAI (Computer Assisted Instruction), interactive multimedia compact disc (CD) and web-based learning materials.

Efforts to develop learning materials have been frequently undertaken by teachers individually or groups in professional tasks. Efforts to develop these learning materials have also received support from the Institute of Quality Assurance and Higher Education Institutions in the form of training and mentoring. The development of learning materials aims to get a decent learning material. In general, the feasibility of learning materials is seen from its potential ability to expand knowledge, improve skills, build mindset, creativity, and cultivate constructive attitudes.

In the other hand, the existence of learning materials still can not fulfill the expectation. Available learning materials still have many weaknesses. The weakness of the instructional materials, among others, the knowledge is often left behind with the information progress; the skills that are developed still relatively lacking to strengthen high-level thinking; mindset, creativity, and attitudes to be built are still unclear to reinforce the character of the subject

When looking at the geographic materials available today, similar conditions are also felt. Geographic learning materials that is available today are relatively diverse, such as textbooks, handouts, posters, clippings, and work sheet. The learning materials still have weaknesses that need an improvement. The weaknesses such as the information presented are often left behind from the development, the ability to think that is built still tend to low order thinking, the developed mindset is still not strengthen the spatial perspective, and so forth. Therefore, geographic learning materials need to develop continuously in order to better the quality of the information presented, the mindset built, and the constructive attitude that will be developed.

On the other hand, geography is the study of places and relationship between human and their information by using spatial and ecological approach. Geography is a knowledge that learns geosphere phenomena by using spatial approach, environment, and regional complex. Material objects include lithosphere, hydrosphere, biosphere, atmospheric, and anthroposphere. In accordance with its scope and its rights, based on its material objects, geography has not been able to

show its true identity, but the geography itself is in the Spatial approach [1].

Spatial Approach is a way of view or framework of analysis that emphasizes the existence of space as emphasis. Space existence in the perspective of geography can be viewed from the structure, pattern, and process [2]. Spatial structure is related to the space forming elements in the form of point features, line features, and area features.

The framework of Spatial approximation analysis is based on the problem of arrangement of spatial elements. In the analysis it is done by answering the questions as follows.

1. What? What is space structure?
2. Where? Where is the structure of the room located?
3. When? When is the space structure formed like that?
4. Why? Why is space structure formed like that?
5. How? How does the structure of such a structure develop?
6. Who suffers what and what benefits what?

How the Spatial structure is utilized in such a way for the benefit of man. The positive and negative impacts of the existence of such a space are always associated with the human interest of the present and future.

Spatial pattern is related to the distribution of spatial elements. The phenomenon of point, line, and area has its own position, either implicitly or explicitly in terms of Spatial agitation [3]. Some examples such as cluster pattern, random pattern, regular pattern, and linear cluster pattern for the appearance of point can be identified [2].

Distribution of area (field) visibility can be formed in linear/axial/ribbon appearance; Fan-shaped pattern, rounded pattern, rectangular pattern, octopus shape pattern, star shape pattern, and some combinations of several existing ones. The six forms of geographical inquiry are always included in each analysis.

Spatial process are related to the change of spatial elements. Therefore, the analysis of spatial change is always associated with temporal dimension. In this case there should be at least two time points used as the basis of the analysis of the phenomena studied. With the Spatial structure, pattern and process, a phenomenon/problem can be fully understood in the context of the environment so that it can be well understood and sought the way of solving it.

Based on these definitions it can be argued that one the perspective in geography is spatial. That perspective suppresses where a phenomenon occurs and why it occurs at that location.

II. METHOD

This research is a type of development research. The purpose of this development is to develop a conceptual model of learning material that based on the spatial perspective. The research use development design of the Borg and Goll with eight steps are: need analysis, planning, develop preliminary form of product, preliminary field testing, main product revision, playing field testing, revision of product, and the final product revision. The subjects of the

research were student of the SMA 5 Malang, one of the Senior High School in Malang, East Java, Indonesia. The number of subjects is 28 students. The material validators is lectures who has a doctor level on geographic education and has worked experienced more than five years. Data collected with questioner. Questioner of the validator is open, while for the subject is closed. The collected data is analyzed descriptively by percentage. Validator suggestions are used for the improvement of the developed steps.

III. FINDING AND DISCUSSION

Conceptual model of learning material development based on the spatial perspective consists of five stages. The five stages are: First, determining the topic of the problem. Writing instructional material start from the determination of objects/phenomena/events which become topics of discussion. In the discussion topic there are always objects, phenomena, and or events. The author of the teaching materials needs to select the objects, phenomena, and or events of the topic presented. For example in the topic of the dynamics of the hydrosphere and its effects on life. In the topic of discussion there are objects of marine and terrestrial waters. In terrestrial waters there are groundwater, rivers, lakes, and swamps. To write these objects, the teacher of the resource development can begin with the necessary auxiliary concepts of science. For example to explain the water cycle can use the concept of hydrology, geology, and climatology. Therefore, the movement of water in the hydrological cycle beyond the area of science aids it.

Second, determining the location and distribution of phenomena or object that is completed by map. Every object /phenomenon/event discussed in the book is explained its location, either absolut or relative. Explanation of the location of obsolut by determining the location of events or objects astronomically according to their longitude and latitude, how many degrees, minutes and seconds. A relative location explanation is done by determining where the event occurred in which administration or morphology area. In addition, also described the distribution of objects/phenomena/events on the map. For example the topic of discussion about disaster. There was a landslide occurring in Banaran Ponorogo. In this step the event described the location of the absolut and its relative, and also described its distribution on the map, among other location locations prone to landslides.

Third, explaining the argumentation why phenomena or object occurs at that location. Objects, phenomena, and events occur in a location not by chance, but are related to space, time, process, and trigger. In writing the development of teaching materials spatially objects, phenomena, and events need to explain why it happened in a particular location or place/region. For example Mount Semeru as a volcanic phenomenon. So in writing not only as an example, but it needs to have an explanation of why it happened at that location.

Fourth, explaining the relation of phenomena or objects that occur with other related natural factors. Events or phenomena that occur are not in a vacuum, but there is always a connection with other natural factors. For example pollution that occurred in Brantas river city of Malang. There are many factors that might affect the water pollution of the

river. The urban households dump their household waste directly into the river mouth. Another possibility of such waste comes from certain factories that dispose of waste into the river so that it can dislike it.

Fifth, using spatial analysis in accordance with the objectives. In the geography approach is known there are at least nine analysis. The nine analysts are pattern analysis, structure, process, interaction, synergy, and so on. One of these analyzes can be selected and used to analyze the data presented in the teaching materials. For example topic of the dynamic of hydrosphere. Identification of the problem at Brantas river is a water pollution. The problem of pollution can be analyzed by process analysis technique. It can be determined with two points in different locations.

The fifth steps has been validated and tested by validator and tryout. Based on the validation, the model was revealed as a visible for developing learning material spatially. The visibility of the model, because it has several advantages. The adventages are: (1) to train student skills to determine a location and related with the other factors spatially; (2) increasing student high order thinking; (3) recognizing phenomena contextually; (4) developing improvement attitude; and (5) using collaborative in working.

The model adventages is accordance with spatial perspective and learning paradigm of the 21th century. In spatial perspective is stated that to study of phenomena need to be stressed location aspect and distribution on the map. There two key questions in spatial perspective are "where is it? and why they are there?". Two of the question can be respons on the conceptual model. The advantages of the model is also in accordance with the paradigm of learning 21th century that encourages the the stude to develop higher order thinking such as critical thingking, problem solving, collaborating, and literacy (BNSP, 2012)

TABLE I. THE RESULT OF STUDENT TRYOUT

Steps of Development	Number of Student (%)			
	Very Good	Good	Low	Very Low
Determining topic	64	36		
Determining location and distribution on map	44	66		
Explaining argumentation	64	36		
Explaining relation	78	22		
Using spatial analysis	57	43		

Table 1 demonstrates the results of experimental models of conceptual development of spatial-based teaching materials. The test results show that the five steps developed, as a whole are quite good and excellent, and according to the students there is nothing included in the low or very low category. The highest student response was the determination step of the phenomenon with the influencing factors (78%), and the smallest response was the determination of location and distribution on the map (29%). It can accure because the explanation of the relation easily understood to students, while the determination of the location of phenomena written in the material is still relatively limited.

IV. CONCLUSION

The result of the research shows that to develop learning material that based on the spatial perspective can be done with the following steps: (1) determining the topic of the problem, (2) determining the location and distribution of phenomena or object that is completed by map, (3) explaining the argumentation why phenomena or object occurs at that location, (4) explaining the relation of phenomena or objects that occur with other related natural factors, (5) using spatial analysis in accordance with the objectives.

The conceptual model of spatial-based learning materials development of this study still has shortcomings that need improvement. The shortcomings are: first, produce a thick textbook material. Such results will certainly be expensive, and at the end may be less affordable students. Therefore, when developing the book with this model the presentation aspect must be made economically. Second, casting phenomenon in the map, certainly not easy. Therefore, in developing the teaching materials is done on a team to cover the weaknesses that may be owned by the author. Third, pouring the analytical aspects of each phenomenon is not easy, therefore it is necessary to understand spatial analysis models for writers more deeply and comprehensively

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