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Mathematics Learning Management at Elemantary School Post Merapi Eruption

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Abstract

This first year study is aimed at describingmathematics learning management done by elementary school teachers. Specifically it is acted to describe room and media management, teaching learning materials, and their interaction in teaching learning process held by the teachers at Selo, Boyolali, Central Java, Indonesia. Wholly, this study is in the frame of research and development (R & D) but for the first, qualitative approach is selected. The informants cover principal, teachers, and the students. For collecting the data, the writer uses observation, in depth interview, and documentation, then the collected data are analyzed by flow method. The results of this study show (1) room and media management done properly makes mathematics learning effective, productive and arising motivation on concept understanding, (2) learning material management makes optimal learning outcome and reflective thinking of the students, (3) interaction management makes teaching learning process lively and happily and finally optimal learning objectives are reached.

Keywords: management; room; media; material; interaction

Introduction

Merapi eruption disaster directly affects the learning process in elementary school. Students can not learn as usual, schedules disrupted learning, a learning tool can not be used and the comfort of the students in the study did not exist. This condition disrupts the learning process that occurs in that school. Under these conditions, the question arises: How does sustainability education elementary school children happen in the region Selo? Is teaching elementary mathematics in the district after the eruption of Merapi Selo effective?

The learning process of math is not effective becauseofmonotonous and unpleasant atmosphere. It is also due to the students is not interested in what is conveyed by the teacher. The teachers do not understand the standards of content, unable to develop the syllabus and subject matter, and the teachers fell difficult in formulating indicators. The teachers use books oriented in teaching learning, abstracts, and rarely connects with the everyday life of students. Teachers do not know the initial conditions of the students so that teachers are unable to motivate students to learn (Sutama, 2011: 28-32).

Starting with that conditions and in an emergency, teachers should focus on the management of learning math in order to make the teaching learning process fun. This issuitable with the principles of curriculum implementation unit level education. The students must receive a quality education services, as well as an opportunity to express themselves freely, dynamic, and fun.

How is the reality on the field? There is a general impression, the ability of primary school teachers in the implementation of school bases curriculum (SBC) is still inadequate. Most of them are still predicated as an executor of SBC and even their activities are a routine. Teachers are not ready to face a variety of changes, limited access to cutting-edge materials, knowledge and learning management skills are also limited. Learning that they are carrying out dry and devoid of meaning.Mathematics that presented to the student is a collection of figures and the formulas. The students did not know how to study mathematics. Teachers use textbooks that separated from the purpose of learning mathematics. Unfortunately these books serve as the primary source for the assessment of learning outcomes.

Aspects in the mathematics learning management includes planning, organizing, implementation, and assessment of learning outcomes. Sutama (2011: 9-10) says that the ATI-based mathematics learning management prioritizes the active role of students, teachers act as a designer, facilitator, and mentor in the learning process. In the process of mathematics learning, management communication is very important. Communication focuses on the importance of being able to speak, write, illustrate, and explain mathematical concepts. Learning to communicate in mathematics fosters interaction and expressionon ideas in the classroom, because students learn in an active environment. The best way to connect with the idea is trying to convey the idea to others.

Dealing with the above explanation, then the writers propose the focus "How is the learning management mathematics by elementary school teachers after the eruption of Merapi in Central Java Boyolali Selo?" Then it is divided into three sub focuses: (1) How do

the characteristics of the management of media space and learning elementary mathematics?, (2) How do the characteristics of the material and the management of primary mathematics instructional materials?, and (3) What are the characteristics of the management of interactions in learning elementary mathematics?

This study aimed to describe the general management of learning math by elementary school teachers after the eruption of Merapi in SeloBoyolaliCentral Java. Specifically, there are three objectives of this study: (1) to describe the characteristics of the management of media space and learning of mathematics in primary schools, (2) to describe the characteristics of materials management and teaching materials in elementary mathematics, and (3) to describe the characteristics of interaction management mathematics learning in elementary school.

The benefits of the research in general, at the level of theory, may contribute to mathematical learning theory primarily on improving the quality of management of learning mathematics. particularly, this research will contribute to improve the quality of mathematics learning management, views of management, and media space, matter and materials, as well as interaction. At the practical level, this study can be used by teachers and students. For teachers, they can use the results of this study in managing learning, thus conducive learning objectives achieved. For students, the results of this study can be used to improve the mathematics learning activity and optimize potential students.

Research Method

This study used research and development. The first studyused qualitative approach. Moleong (2006: 6) states that qualitative research is a research that results in the analysis procedure and use of inferential statistical analysis procedures. According to Sutama (2010: 32) qualitative research is directed to understand social phenomena from the perspective of the participants. The location of the study was in post-disaster elementary school Merapi eruption in SeloBoyolaliCentral Java. The study took eight months, from January to August 2012.

Data Sources of the study included informant, documents, places or events. Informants were the principal, classroom teachers of class IV, V, VI, and elementary school students: Selo 1, Samiran 2, Tlogolele 1, Tarubatang 2, Suroteleng 2, and Jrakah 3 SeloBoyolali. Techniques of data collection were observation, in-depth interviews, and documentation. Techniques of analyzing the data used qualitative analysis with flow method. The validity of the data used a triangulation of methods and sources, and checking with the members.

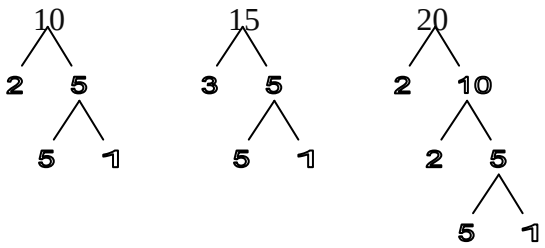
Research Findings and Discussion

Management of room in early mathematics learning activities, generally,uses seating positionand classical models. The classical modelsthat used are all forward-facing seats (four rows and four columns). One table by two chairs were occupied by two students. The results

of research on the management of this classical model space can be interpreted that the delivery of public information for learning (such as learning objectives to be achieved by students) is more effective with classical shape layout. According to the theory of constructivism, teaching is not about transferring information to students and the learning is not passively absorbing information from books or from teachers. But teachers need to motivate students to construct their own ideas by using students' own ideas.

On mathematics learning in Tlogolele 1and Samiran 2, teachers provide examples of workmanship problems in exploration activities. In elaboration activities, students work on a group and report the results of their work.Confirmation activities are done by the teachers, the teachers and the students conclude the work, after the teachers correct the misunderstanding. The examples of the material presented by the teachers Tlogolele are as follows.

1. 10 + 8 x 2 – 5 = 10 + 16 – 5 = 26 – 5 = 21
2. 6 – 9 : 3 x 2 + 7 = 6 – 3 x 2 + 7 = 6 – 6 + 7 = 0 + 7 = 7
3. FPB dan KPK dari 10, 5 dan 20 adalah



10 = 2 x 5
15 = 3 x 5
20 = 4 x 5

FPB = 5

KPK nya = 4 x 3x 5

= 60

The result mentioned above, the core activities use setting a classical space, change small groups, and turn into a form of letter U. Classical work happens when students follow the example. In small groups, each student discusses the problem solving. The using of U shape at the presentation shows the results, it can be interpreted that seat setting can change at any time, depending on the learning method used. Changes in spatial research were supported by Rebecca, Lina Clement, Randolph Philipp, and Jennifer (2004:60). They stated that the process of learning mathematics requires specific changes.

Management of U space model can be used during the development of the concept of teaching materials through media demonstration, problem solving through role play, and discussion during class. It is similar to DePorter’s opinion (2001:70) which provides an alternative learning setting of bench, and for a large group discussion led by a facilitator who wrote the idea on writing paper, whiteboard or blackboard use semicircular space setting. To give individual assignment and instruction to a small group or large group discussions while sitting on the floor then close the bench to the wall, if you can, replace the traditional benches with tables and folding chairs to be more flexible.

Seifert (2008: 225) says that most of the physical conditions of classrooms have an influence on the possibility of interference. Room temperature is too cold (or too hot) and the ventilation system is messed up, for example, and actually proven to reduce most of the students in the focus of the educational materials. Building on Seifert opinion means condition of seating students in learning mathematics is essential. Leisure related to room air circulation, lighting, and noise need to be managed properly in order to create a productive culture of math classes.

According to Heibert(inVan deWalle, 2007:31) productive mathematical classroom culture is important for students, they can learn from her classroom and also from their reflection activities. Productive mathematical classroom culture has four characteristics, namely (1) ideas are important, (2) ideas should be understood together in the classroom, (3) the trust must be built with the understanding that making mistakes is not the problem, and (4) the students have to understand that mathematics can be understood or made sense. The four characteristics are parsed briefly below.

The ideas are important, no matter whose idea. The students can have their own ideas and share them with other students. They also need to understand that they can also learn from the ideas that have been formulated by others. Learning mathematics is to understand the ideas of the mathematical community.

The ideas must be understood together in the classroom. Every student must respect the ideas of his friend and try to assess and understand it. It is very important to give an appreciated during discussion.

Trust needs to be built with the understanding that making a mistake is not a problem. Students must realize that mistakes are opportunities for growth. All students need to believe that their ideas will be true or false. Without this trust will never be an exchange of ideas.

The students should understand that mathematics could be understood or made sense. As a result, the truth of a result is based on the math itself. The teacher or others is not decided the truth of the students' answers. In fact, if the teacher always say "yeah, right" or "wrong" then the students will stop to understand the ideas in the classroom and in the discussion, so that the learning activities will be reduced.

Mathematic class with productive characteristics does not happen. Teachers should be responsible for making a productive classroom culture. This can happen in two ways. First, there should be a lively discussion about the basic rules in class discussions. Second, teachers must be able to model the types of questions or the interaction of students.

At the closing session, general in primary place of research is setting back seat in the classical form. It is based on the closing predominantly action learning, namely reflection, draw conclusions, and assignments. Thus, it can be said that setting of seat can be changed as needed based on the consideration, teaching materials, methods, and learning objectives. Except for this, the decision-making that involves teaching a seat in the classroom setting should be managed any period of time.

The decision was made when planning a study. What is the best task given tomorrow? By paying attention to what is happening today, what would be used to move students forward? Decisions are taken by the minute in the classroom. How should I respond? Should students try harder or should I interfere? Is there any progress made? How can I help students in the right direction without discourage him?

Learning mathematics in elementary school Selo 1 and in schools observed, the standard competency (collecting and processing data) and basic competency (collecting and reading the data), the teachers use lecturing method, demonstration, observation, question and answer, and exercise. Learning tool used that is the dice and coins. The tools used are to support learning, colored chalk and a wooden ruler. Interviews, other media used in learning of mathematics are media images, shapes wake up a room, milk cartons, and food cans.

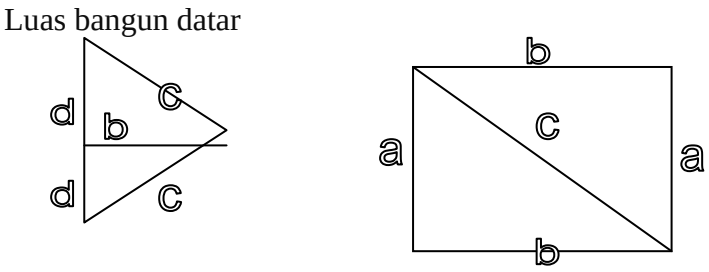
Media include images, shapes wake up a room, milk cartons, food cans, called the visual media and used to foster students' understanding of concepts. Visual media will help students to think more concretely. Visual media show the abstract concept becomes more real.

The trend of primary school teachers have not been utilizing media research site in the form of powerpoint projection silent. Media silent projection is used to increase student motivation in learning and to increase understanding of the concept. Media, which use Information and Communication Technology (ICT), are not used in the learning of mathematics in primary research site. The use of ICT-based media support teachers in their role as facilitators of learning. Motivation, curiosity and understanding of the concepts, students can also be obtained from the use of ICT-based media. These results contrast with the results of Nguyen, Yi Chuan Jane Hsieh, Donald O Alien (2006) which state that the positive effects of assessment and application of internet media to enhance the learning ability of students in middle school mathematics.

Media have significance to the success of a lesson. Media are anything that can be used to deliver a message from the sender to the receiver, so that it can stimulate the mind and feelings. The Park and Yoo Hong Park (2001) that confirmed this said that with media children can construct their own knowledge and understanding; teachers can not transmit ideas to passive learners. These ideas are tools that can be used to construct new concepts and procedures. These ideas cannot be poured into the children as the water poured into empty vessels.

Management of teaching materials in elementary mathematics research site, the order is based on the syllabus, the annual program, the semester program, and Learning Implementation Plan. Basic development is Content Standards. Teacher Working Group is a forum, which contributes greatly in improving teachers' understanding and learning document preparation. This is in accordance with the opinion of Sutama (2011: 34) which states through Teacher Working Group problems encountered in math can be solved together. However, its implementation has not been optimized in implementing teacher understanding of learning in the classroom. It can be seen from most of the teachers in the implementation of learning.

Learning mathematics in elementary school Tarubatang 1 and Suroteleng 2 with competency standard calculation the area of a flat wake and basic competency calculation the area of a triangle with a rectangle, learning strategy used are to do the experiment. The methods used are observation, discussion and exercises. Learning tool used are waking flat (square, triangle, rectangle). Management of mathematics teaching materials starts from the beginning of learning activities, deliver learning objectives, and frequently asked questions previous material. In exploration activities, students are invited to experiment with a square and a triangle shaped rectangle. Students are asked to work on the problems related to the formula for the area woke up flat. In activities elaboration tasks, students are asked to come up with the idea of the wide variety of formulas flat wake. Teachers in activity confirmation give praise to the students. The teachers make a conclusion together with the students. Apparent depth of the material has appeared, the complexity of the material exist. Here is an example of the material presented by the teacher of elementary school Suroteleng 2.



Management of teaching materials in elementary mathematics research site pays attention to the urgency, complexity, and depth of the material. Urgency, complexity, and depth of the material in the management of the material must be considered, because if you do not pay attention to these three things then in the delivery of material is less meaningful for students. According Sutama (2011: 26), teacher of mathematics should be taught to master the material in all types of questions that may be of any teaching materials and pay attention to the type of questions given to each daily test or given for homework. Students must learn mathematics with understanding, actively build new knowledge from experience and prior knowledge.

Furthermore Sutama says that master of all types of matter, teaching materials drawn from a variety of materials. Problem daily tests is better contained three types of questions, the type of subject matter that has been discussed thoroughly, the type of questions that have been granted but not yet thoroughly discussed, and the types of questions that have not been given. Homework assignment is with regard to teaching materials are important, difficult, rewarding future, and the steps work (all of this so that students learn on their own at home). Both daily tests and homework used to guide and enhance student learning. Feedback from the daily tests and homework will help students achieve learning goals and make them not always depend on others.

Mathematics instructional materials that teachers use on research place including textbooks and worksheets. Textbooks and worksheets handed out one-on-one for each student.

Textbooks and worksheets used as the main reference for the sequence of teaching materials, both delivered on the learning process.

The results related to instructional materials, namely textbooks and worksheets as the primary reference in learning mathematics, show that mathematics teaching materials are lacking. Learning resources are used by teachers in teaching is still limited to the handbook, not use such literature, the scientific journal of mathematics, teachers' personal library with books learning resources, and searching website on the internet. The use of the environment as a learning resource teacher has not been widely understood. Understanding classes in mathematics learning are not only in school but can be done outside of school (out of the classroom).Zerpa, Ann Kajander, and Christina Van Barneveld (2009: 60) show that the learning environment is an important factor in students' mathematics learning and curriculum implemented in the classroom is more effective when practice-based learning environment related to mathematical problem solving.

The dependence on the teacher of handbook is large, making the learning process takes place with your handbook is not the lesson plans developed. In turn, teachers are not able to change the learning of mathematics required for students to develop math skills. According to Sutama (2011: 27) studied mathematics ability that successfully develop, namely the brain and body motion together based instructional materials varied and fun run in the corridors. This is in line with the results of the study Ysseldyke, Joe Betts, Teri Thill, and Eileen Hannigan (2004: 64) who concluded that teachers use curriculum-based teaching management system to focus on the management of teaching math fun; it can increase student achievement in mathematics low school.

Management of interaction in learning mathematics in elementary school 1 Tlogolele 1 and Suroteleng 2 began pre-learning. When entering the classroom, the teacher began with greetings and answered by the students with enthusiasm. Furthermore, teachers begin the process of learning to communicate mathematics learning objectives of the day followed by apperception. Teachers ask guiding questions, relating to the material that never learned before and the material to be studied. At first, the students replied, then the teacher pointed to a student, and students are assigned to answer questions correctly. Then the teacher gives motivation by giving examples of resolving various problems in daily life.

At the core activities of learning mathematics in elementary school Selo 1 and Tarubatang 1, students make group member heterogenic based on ability or gender. The student in-group discussions are to develop the concept and practice of teaching materials and independently controlled either by worksheets that have been provided. During the discussions, it seems some students asked the teacher. When the discussion is complete, then followed by work on the problems still in small groups. After the set time runs out, the teacher pointed to one of the groups to come forward and present the results of their discussions and other group responded. Exercises performed independently and after a student presentation, the teacher leads a class discussion to discuss the results of self-employment. The process is quite lively class discussions, although students who responded or asked still dominated by a few qualified students.

Teacher as facilitator of learning has a very important role to foster better interaction between students and students and between students and teachers. The ability to ask questions to the students, the ability to respond to students' opinions, and the ability to manage the problem is major boost in teacher interaction with students. According to Van deWalle (2007: 6), teachers need to (1) change the class just a collection of students into the mathematical community, (2) make the logic and mathematical evidence as a means of justification and deny the authority of teachers to decide the truth, (3) attach importance to an understanding of just considering the procedure, (4) importance to make alleged, discovery, and troubleshooting as well as away from the pressures of the present invention a mechanical response, and (5) relate mathematical ideas and applications, and does not treat mathematics as a collection of concepts and procedures are excluded.

If the students are not active during the learning of mathematics, not many questions or comments during the study, only the completion of tasks on the board with the help of the teacher, the learning of mathematics is not productive. Such circumstances can be interpreted, that students lack confidence or do not have a positive attitude towards mathematics. According to Juter (2005: 104), students 'positive attitude or a confident attitude towards mathematics influenced students' ability to solve math problems successfully. Students, who have positive beliefs, perform better in solving the problem or students who are able to solve the problem of having a positive attitude towards mathematics.

The students interaction occurs when students work together in small groups, ask students to other students, students help other students, students discuss with others. To foster interaction, students to students, to increase student motivation and positive attitude, innovative learning models will also foster interaction among students. Because in a definite learning model have already contained the steps that are clear, organized, and systematic. Positive interactions will occur if the learning model is implemented.

Sutama (2011: 12-13) says that basically, the learning model is a form of learning from beginning to end, typically presented by the teacher. In other words, the learning model is the frame of the implementation of the approach, strategies, methods, techniques, and learning tactics. Learning model is a general pattern of behavior learning to achieve basic competence expected. Learning model can be used as the pattern of choice, meaning teachers may choose an appropriate learning model and efficient way to achieve the goal of education.

Usually structured learning model is based on the principles of education, theories of psychology, sociology, psychiatry, or systems analysis. Joyce and Marsha Weil (1996: 13-20) state that studied learning model based on learning theories and teaching models are classified into four, namely: (1) a model of social interaction, (2) information processing model, (3) personal model, and (4) model of behavior modification.

Results of research conducted by Eck and Jack Dempacy (2002: 54) also support the need for proper selection of models, approaches, strategies, methods, techniques, and learning tactics. The results showed that the transfer of learning can be enhanced by using simulation games and creating instructional considerations. All the roles of competition and considerations will play a role in increasing contextualization transfer. Another opinion that

corroborates these results said by the Elida and Nugroho (2003: 15) as follows: good teaching practice is using variety of teaching methods.

Closing

The conclusion of the study shows that the management of the space of mathematics learning process is effective and productive. Space management is the process of maximizing class physical condition, ventilation, temperature, seating, tables, and other tools that support the learning room comfort. The learning process effective and productive, which is a process of learning that involves learning components and the goal is reached optimally.

The development of Media management raises motivation and understanding of concepts. Media management is a process that optimizes all people, materials, equipment, or activities that create the conditions that allow students to acquire the knowledge, skills, and attitudes. Motivations are an encouragement and hope to foster a positive desire. Understanding the concept is the ability to understand abstract ideas that can be used to classify or categorize a set of objects.

Holistic management of teaching materials is to realize optimal learning outcomes. Holistic management of teaching materials is noticed urgency, complexity, and depth of the material. Learning outcomes is a change in behavior related to cognitive processes and products, affective, psychomotor, and social skills acquired after learning.

Management of a variety of teaching materials is created to develop reflective thinking skills of students. Management of a variety of teaching materials, the use of an assortment of book learning resource can be used as a reference for learning. Reflective thinking is an activity that is active, not passive, and requires effort (the effort included prayer and action), reflective thinking explains something or tries to connect to elated ideas. Reflective thinking can occur while students are trying to understand the explanations of others, when students are asked, and when students investigate or explain the truth of their own ideas.

Management of interactions makes learning lively and fun, and in turn it can achieve optimal learning goals. Management of interaction in learning mathematics is setting a reciprocal relationship between teachers and students, as well as students to students optimally. The learning process is a lively and fun, the learning activities to optimize the ability of students to teacher as facilitator and diverse activities that help achieve optimal achievement of learning objectives.

The results of this study are suggested both for teachers and students. To the teachers, management must be able to support the understanding of space high mathematics. Teachers need to manage effectively teaching materials by utilizing a variety of teaching materials by understanding what students know and need, then provide challenge and support to enable students to learn it well. Interactions in learning mathematics have always developed through healthy communication, from pre-study to the assessment ends. Assessment should support the learning of mathematics and provide useful information for teachers and students.

Students must learn mathematics with understanding and actively construct new knowledge by using ICT. Technologies affect the development of mathematics and improve the quality of student learning.

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