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Contextual Math Learning Based on Lesson Study Can Increase Study Communication

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Abstract

The aim of the research is to examine the conceptual design of learning contectual math based on lesson study. The impact of try out is the changing math study communication. The research used qualitative design. The research location is elementary school after the eruption of Merapimountain at Selo, Boyolali. Teacher grade IV Sekolah Dasar Negeri 1 Seloas a teacher model. Technique of data gathering: observation, in depth interview, and documentation. Tech nique of data analisis, comparative and critical analisis. Data validity used triangulation, method and resource. The research result showed that, contectual math learning based on lesson study can increase math study communication. *Lesson Study that is done by the teacher in his/her group cyclely*, mainly: (1) learning syllabus and content standard, (2) developing planning of conducting learning, (3) model teacherconducted learning, and (4) result reflection of learning conducting. Contectual math learning based on *lesson study*is conducted in five stages. 1) Students' orientation on problem situation. 2) Students coordinate for studying. 3) Investigation guiding both individual or group. 4) Developing and presenting creativity result. 5) to analyse and evaluate problem solving process.

Keywords: communication; contectual; lesson study

1. Introduction

Math study communication is important. Cockroft (1982) stated that students need study math for some reasons, math as a means of communication that is very strong, accurate, and unconfusing. But, math learning approach at elementary school (SD) Selo district, Boyolali mostly still centering on teacher. This what we called as teaching activity not learning activity. Teacher' domination in teaching can make math learning communication not effective. Sutama (2011: 28) said; Math learning is not effective because of (1) math learning tend to *text book oriented*and abstract, also unlink with students' daily life, and (2) teacher lack of doing useful learning by using lovely and interesting strategy.

Based on the above thoughts, it is better for teacher to focus on learning management by using the lovely strategy, mainly; contectual learning based on lesson *study*. It can stimulate children view in responding environment (Johnson, 2009: 15). *Lesson study*as a model of guiding educator through learning recited collaboratively and continously based on collegiality principals *mutual learning* for building up study community (Susilo, dkk., 2009: vi).

Result year I (Sutama, Sabar Narimo, and Haryoto, 2012) that is linked with the development of conceptual design contectual math learning based on lesson study, mainly the development of planning learning conducting (RPP), study room management, media, lesson material, interaction management. Research result that is linked with each development was explained below.

Developing RPP with contectual strategy based on the problem in small group. The activities step 1:students' orientation on problem situation, step 2: to manage students for study, step 3: to guide individual research or group, step 4: to develop and to present creativity, and step5 : to analysis and evaluate process that has been done in learning.

The developmentof room management in class, classroom setting changed cyclely, mainly clasicaly, small groups, and U form. Room management out of class, free as in line with the learning goal. Room management classical model for delivering general information (learning goal that should be achieved by students).In small group students discussed problem solving.U form isused for presenting discussion result.

The development of media management, using visual media andsilence projection. Mediathat involved pictures, building form-room building, milk kardus susu, food tin, called as visual media and used for growing up students' concept understanding. Visual media will help students to think more concrete, because visual media showed students from abstract to real concept. Silence projection media like*powerpoint,* is used for increasing students' motivation in learning and understanding concept.

The development of lesson material give attention to urgent, complexcity, and material depth. Lesson material is developed from many variant of it. Daily test material consist of three typesitems, mainly item type that has been discussed completely, item type that has been discussed uncompletely and item type that has not been given. Homework that relate to important lessson material, difficult, useful for tomorrow, and gave the clue in order students

can do by themselves. Both, daily test or homework is used for directing and increasing students' study. Feedback from daily test and homework will help students to achieve their study goal and make them not always depend on the other person.

Development of interaction management that is begun since pre-learning untill closing and teacher as facilitator. He has very important role in learning for growing up good interaction inter students or students with teachers. The ability to ask, to response students' opinion, and to manage problem is something important for increasing teachers and students interaction.

The development of math learning evaluation, mainly authentically based on cognitive, affective, psychomotor and social aspects. That evaluationis the form of students' attitude scoring comprehensively, so that the result can be used for accurate prediction.

Research year II directed for examining the conceptual design of contextual math learning development that basedon *lesson study*.This try out is applied for contextual math learning development basedon *lesson study as in line with the design that is developed*on research year I by observing elementary school for math study communication changing.

2. Research Method

The kind of research overall used research and development. This research(year II)used qualitative approach (Sutama, 2010). Research location is SD after eruption MerapiSeloBoyolalicentral java. Data sources included informant, document, and place or event. Informants mainly; principal, class teachers IV andstudents of elementary school/SD Negeri: 1 Selo, 2 Samiran, 1 Tlogolele, 1 Tarubatang, 2 Suroteleng, dan 3 Jrakah Selo Boyolali. Class teacher IV SD Negeri 1 Selois a model teacher. Techniques of data collection, observation, in depth interview, and documentation. Techniques data analisis used comparative analisis and flow method critical. Data validity used triangulation method and sources.

3. Research Result and Discussion

At the beginning, teacher tends to use speech method and more dominated learning as a resultthe decreasing the students' oppurtunity in expressing idea. Research activity is begun by *lesson study* and teacher adapted his self with contextual learning strategy. Teacher should be able to choose and use innovative learning study, like contextual. Khandaghi and Maryam Farasat (2011) said, learning strategi usage as something important that should be given attention by teachers in order that got maximum learning output.

Lesson Study is done by teachers in their group based on stages secara siklik, those are: (1) to study content standard and syllabus, (2) To develop RPP, (3) model teachercarried out learning, and (4) result reflection of learning conducting. At cycle I, teacher is able to play as facilitator to link the lesson material with students' experiences. Teacher still tend to dominate in ask and answer. The research of Deen and Smith (2006) concluded that

contextual learning strategy can be applied with teacher always link the lesson material with the students' daily experiences. It means, teacher action at cycle I has shown contextual direction.

Math learning direction that is done by SD/elementary teacher after Merapi eruption towards contextual, so that students enthusiastic to study. According to Johnson (2011: 57) contextual learning has four strength 1) PembelajaraIt gives oppurtunity to students for finding the meaning and themselves in academic lesson by seriously linked to school job with dailydengan activity and students' interest. 2) It can be used by all students, both the most talented students or students who has difficulty in study. 3) It is as very interesting strategy. 4) It gives oppurtunity to all of students for developing their ideal.

At cycle II, teacher begin usual with contextual learning strategy, class situation is more lovely. Students in small group can convey their own opinion. Teacher' role as facilitator to be bridge for students in developing math' idea. Teachers felt the real succeed towards their learning. It appears self confidence of teachers for implementing contextual strategy in their teaching learning process.The research result is in line with conclusion from Kocak, Bozan and Isik (2009), that students study math in a group is better in understanding the problem. Students more appearing the new ideas by aplicating their understanding than memorizing the formula.

Implementation of contextual math learning based on less*on study*for this research, class situation condusive and lovely. Research result that is done by Vikis (2008) to support the need of implemented strategy that create students happy in learning. Futhermore Vikis stated that teacher should have instructional planning and giving facility and supporting for students in order the learning process go on lovely. Another opinion that strengten the result of this research is u Puteh dan Mahani Ibrahim (2010) said that teacher should be able to increase students recognition how important the learning strategy so that students can follow the teaching learning process happily and conviniently.

Learning proses that is done by model teacher at research place, situation conducive, uniqe, and interesting. Research result is in line with Deen' opinion (2006) stated that contextual learning strategy as relative new concept and followed by professional teachers, strategy application go on regularly so that learning process to be uniqe and interesting. Learning process example that is done by model teacher at elementary competence (KD) 3.2. Determined the relationship between inter time, length, and weight unit, (time 2x35 minutes) explained below.

The first activity, stage 1: Students' orientation at problem situation. Aperception, through ask and answerto remind about length unit and gradually used length unit ladder. Every step down one ladder(Figure 1)multiply ten. Every step up one ladder divide ten .

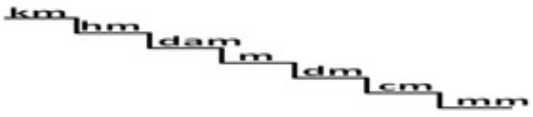


Figure 1: Ladder

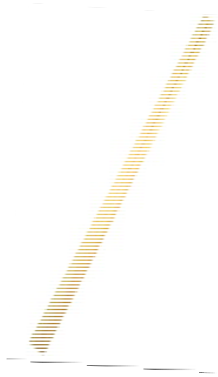
Students learned the goal of learning from power point, about the relationship of inter length unit. To motivate students by problem learning that is linked with daily life at silence projection below:

> "At Nadia' home will be conducted family gathering. Nadia with her family were cleaning and managing house neatly. Nadia is asked to help her mother for managing food table. In order to be more beautiful, Nadia wants to give colorful at sides of food table by using ribbon. Food table' length 270 cm, and width 240 cm. How long the ribbon that should be bought by Nadia in order match with the size of the food table?

To motivate students through linked lesson material with students' experience in daily life can bring it to concrete experience. It can push students to be enthusiastic in math learning happily. Research result Rawana, et.al. (2011) stated that one of the goals of character education was to bring in real character, so that easier for internalitation with keep maintance focus positively. It can be meant that the way to motivate through problem discussing that is linked with students' life, preparing study experience framework that support students hope and motive strength.

The core activity: Eksploration. Stages 2: to organize students to study. Students make small group consist of 3 or 4 students heterogently (9 groups). Each group determined one of members to be the leader, he/she took worksheet/LK or one of problems (three problems). Students worked together to discuss the problem through problem solving discussion. The problem example on worksheet/ LK.

Problem 1



Problem 2


Mrs. Tatik is in birthday. Tatik wants to give present/gift to her mother. That present/g will be wrapped by using caping box. The caping box in the form of rectangle, with the size length 52 cm and width 78 mm. In order the wrapping present/gift more beautiful, Tatik wants to colorful side of the caping box by using ribbon. How many mili meter ribbon that is used by Tatik?

Problem 3


Fina has beloved blanket. Fina always take care of her blanket in good way. At the edge of blanket will be given mh colorful renda that different color with her blanket. Fina' blanket in rectangle for with the size of length 18 dm and width 90 cm. So how many cm renda that is needed by Fina?

Through group discussion for problem solving, students' potential that is link with to know, understand, do, togetherness in living, and self actualitation can appear.The research result is in line with Haling' opinion , et.al; (2012) stated that, learning with problem solving planning in a good way has incredible *output*. It means that exsploration activity in math learning in daily by preparingthe story in daily life is in line with students' experience can dig up students' potential maximumly.

Elaboration, stages 3: to guide individual or group research. Students is given wide oppurtunity for thinking and acting according to their own way. To motivate and to facilitate students in study, by guiding question and observation roundly.

Elaboration activity in math learning is directed to develop students' potential. Through research guiding that is conducted interactively, lovely, challenge, to motivate, and giving enough space for pioneer, creativity, and for students, students' potential can be developed optimally. It is proved by students' question, such as: " Sir how if two different measurement unit and asked for another measurement unit? (12 km + 1100m = ... cm)." Pak Sunarno gives oppurtunity for others students for answering the question. Some students raised their hands, then one of them came forwards to answer," just changed your unit to another unit that is asking" (km changed to cm and m changed to cm), then just added".

Confirmation, stages 4: to develop and to present result. Each group presented group result in front of the class, by delivering the way to finish problem and reason for the answered. Others groups give response for group presenting result. Strengten is given to students' answer, towards students' answer and through ask and answer question to discuss problem solving that is presented. Through ask and answer question for improving the mistake understanding, make establishing to count length measurement from each group.

Confirmation activity in math learning, directed to know students' potential (competence mastering that is hoped) after doing students' experience. Confirmation activity is to develop students' creativity. It can be seen from students' group in facing divergen item solving (Jati has a sheet paper in rectangle form with the size 30 cm x 20 cm, cut it to be four triangles then measured the round of each triangle that is got). Through divergen item, students is faced to many true answer, so that, there are a lot of communication happened in live discussion. In order that discussion consistent in sub problem, teacher as facilitator always direct students with the guiding question.

Closing activity. Stages 5: To analysis and to evaluate problem solving process. Through ask and answer question to reflect activities that are done, such as: material that is mastered by students, material that has not been understood, why has not been mastered in good way? And the next alternative action. Through ask and answered, make conclusion of way measuring length by connecting inter length unity. Post-test. To give homework and information of material that will be discussed at the next meeting, mainly weight measurement material.

Closing activity in math learning, keep directed learning for students centered. Through the guiding question students reflected and made conclusion lesson material that is learned. At a

lovely condition students independencely, responsible, and honest to do post-test items that is prepared(easy items: the problen that has been given and discussed completely, average items: A given problem but has not been completely discussed and difficult items: (problem that never been given). Students noted homework and material that will be discussed at the next meeting. Learning meeting is ended with praying together and closing regards for celebrating the successful at that time.

At contextual math learning process based on *lesson study*as mentioned above, teacher give problem that is link with real life. (problem 1, 2, dan 3). In a group, students faced with different others students that different in ability at the beginning. Students can perform math idea, so that, give impact to the leveling of math study communication. It is in line with research result of Komalasari (2012) stated that contextual learning has influence significantly towards students ability. Research result of Coker, Catlioglu and Birgin (2010) stated that in contextual learning strategy students has oppurtunity for combining material with their daily life. Students that has studied with contextual learning strategy can understand material concepts in a good way.

Contextual learning at this research is conducted with discussion method. Group discussion can form students' character for thinking critically in developing ideas for problem solving. Perin (2011) stated that contextual strategy as the linked of math' concepts that can develop the ability nand motivation of the students study.Begitu pula Bronack, dkk (2008) stated that menyatakan bahwa contextual learning strategy can develop students' ability and skill in math contextual learning strategy in this research can increase communication and students' study result in math.

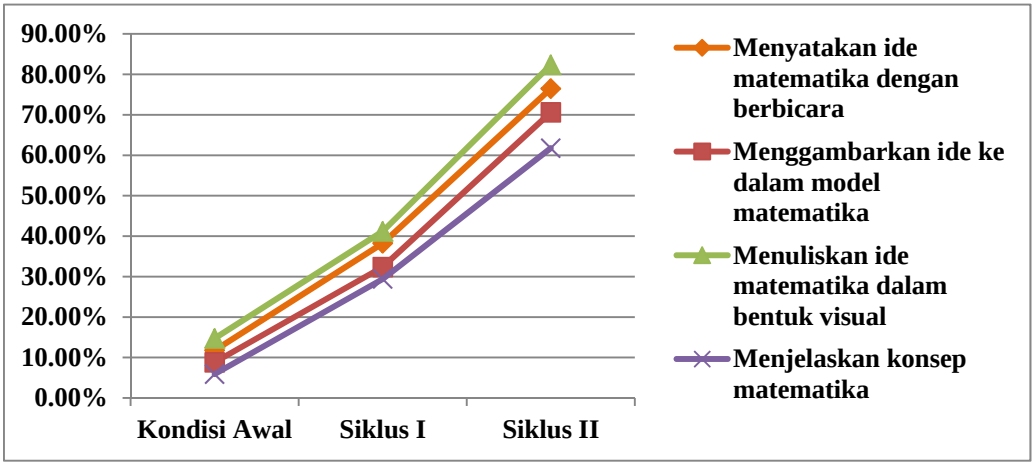
During discussion, students can state many ideas and explain many math concepts both orally or written form Suryawati, Osman and Meerah (2010) stated that contextual strategy FRAME/RANGKA (formulate, observe, state, join, communication, practice) succeed to increase the ability of problem solving, but did not give impact significantly towards students' character. RANGKA contexctual can increase students' critically thinking ability and train students for more being evaluative.

At this research, students were faced with the real problem with intended in order the learning more meaningful. Math learning that is meaningful to link with many problems in daily life. Students is given oppurtunity to develop communication ability in presenting math idea. It is in line with research result Debreli (2012) concluded that the implemented of contextual learning strategy is conducted by developing teoritis application recognition that has been known by students

Students grade IV SD selo I, 34 children.At the beginning, cycle I, and cycle II, math study communication data illustrated at table 1 and picture 1.

Tabel 1: Math Communication Data

No	Communication Indicatorstudents' math	Before Acting	After Acting	
			Cycle I	Cycle II
1	Stating math idea by speaking	4students (11,76%)	13students (38,24%)	26students (76,47%)
2	Describing idea into math model	3 students (8,82%)	11students (32,35%)	24students (70,59%)
3	Writing math idea in visual form	5students (14,71%)	14students (41,18%)	28students (82,35%)
4	Explaining math concept	2students (5,88%)	10students (29,41%)	21students (61,76%)



Picture 1: The increasing of math communication

Before research is done, students are afraid when stated the idea, students are worried if the idea not in line with the hope. At cycle I, contextual learning strategy can push students to convey their ideas by using usual language. Implemented discussion is able to explore the students thought so that give positively impact to students' orally communication ability. At cycle II, students no more felt afraid when conveyed ideas. Students who gave oppurtunity to work in group showed good progressing, when they shared ideas.

At the beginning, students ability in describing ideas to math model not in line with the hope. Students can not differentiate variables that were used to solve the problems. At cycle I, students are able to state idea into model math correctly. It is pushed by students' curiousity highly in discussion. At cycle II, students begin to understand the way to describe ideas from one daily problem into math model. In completing the problem, students should be able to do items gradually. For that, needed accurately in stating many problem to math form. Before teaching action, the ability of students to write math idea visually is variant. To communicate math idea in written in order can be understood by others people is not an easy job. Cycle I showed that students can write math idea visually is increasing. The skill of writing has

closed relation with the language usage. At cycle II, students could present content, idea, or math concept in writing form. By understanding ability, thought, and linked.

At the beginning, students' ability in explaining math concept is not line with hope. That ability is needed when discussion goes on. But the reality that students cannot be able to draw all ideas that they have. Students lack of self confidence when they explained math concept. At cycle I, students are brave enough to explain the concepts that they understood to their group.The group forming randomly as in line with their willing to stimulate students' communication. At cycle II, teachers make improvement by group forming heterogenly. This is in line with resarch resultsof Viseu dan Oliveira (2012) stated that communication in math learning through more effectively if done it with the closed friends.

Many problems that has been discussed always linked with students real life, so that stimulate discussion resarch resultsto be live and meaningful. Students stated math idea by speaking, writing, and drawing, and explaining math concept in a good way. Kosko and Wilkins (2010)stated that students used manipulation for math study more tend actively in communication. This condition showed that students more using thinking ability critically in discussion to appear communicative attitude in completing the problem. This research indicates the same things that manipulate in completing the problem should be done when students worked with their group. Discussion and ask answer method can motivate students for more communicatively.

Mahmudi (2009) stated that communication process that used opening problem and designed in a good way can push students to understand math material maximumly. Math learning in a good way will stimulate students in developing students' ideas and math abilities. In this research, mistake is contextual with linked to students real life. It can able to push students' communicative manner in presenting their creaitivity result. Lipeikiene (2009) stated that math communication concept is used in variant aspects and leveling. Curriculum is the main aspect in math communication that guarantee education more inovative. In this research, the main aspect for increasing communication, mainly; is the application of contextual innovative strategy. That innovative strategy can stimulate students in developing math communication ability.

4. Conclusion

Contextual math learning based on lesson study can increase math study communication. *Lesson Study is conducted by teacher with their group* secara siklik, mainly; (1) to recite content and syllabus standard, (2) developing RPP, (3) model teacher carried out learning process, and (4) reflection the result of conducting learning. Contextual math learning based on lesson study Contextual math learning based on lesson studyis conducted in 5 stages. Stages 1) Students' orientation is on problem situation. Stages 2) To manage students for study. Stages 3) To guide individual or group research.Stages 4) To develop and present creativity result. Stages 5) To analyse and evaluate problem solving process. *Increasing communication is observed from four indicator*r, mainl; 1)**To state** math ideas through

speaking, 2)**To describe** ideainto math model, 3)**To write** math idea into visual form, and 4)**To explain** math concept.Increasing communication has impact towards increasing on math study result.

Based on the research result is suggested: both for headmaster or teachers. Headmaster, Lesson study should be enlarged and conducted continuously. Teachers, Managing lesson material effectively is linked to students' daily life and used variant lesson material, then give challenging and supporting in order students can learn it in a good way. Interaction in math learning always developed through healthy communication; begin from pre-learning until the last scoring. Scoring should support math learning and give useful information for teachers and students.

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