

# The Application of Contextual Approach in Learning Mathematics to Improve Students Motivation At SMPN 1 Kupang

Ch. Krisnandari Ekowati<sup>1</sup>, Muhammad Darwis<sup>2</sup>, H. M. D. Pua Upa<sup>1</sup> & Suradi Tahmir<sup>2</sup>

<sup>1</sup> Faculty of Education, Nusa Cendana University, Indonesia

<sup>2</sup> Department of Mathematics Education, Post Graduate Programs Makassar State University, Indonesia

Correspondent: Ch. Krisnandari Ekowati, Post Graduate Programs Makassar State University, Indonesia. E-mail: ekowatichristine@yahoo.co.id

Received: February 14, 2015    Accepted: March 18, 2015    Online Published: July 27, 2015

doi:10.5539/ies.v8n8p81

URL: <http://dx.doi.org/10.5539/ies.v8n8p81>

## Abstract

This research is an action research which aims to implement contextual teaching and learning (CTL) approach to learn mathematics, focus on the integration subjects. The approach utilizes the use of mathematics manipulative so that students can understand a mathematical concept to construct their own. The method which used in this research are descriptive method for calculate the student results. The object of this research are 41 students of the 7<sup>th</sup>E grade students of SMPN 1 Kupang. Mathematics Teacher and researchers became observer. The research was conducted in three cycles, with an overview of the following results; (1) there is an improvement of student motivation in following the learning process which can be seen from their enthusiasm in trying the counting beam either beads number aids (2) student activity increases which can be seen from their cohesiveness for solving the question and the cases which given in their group, (3) their mastery of concept ialso increases which is seen from the mean of their group mark from cycles 1 (35.8%), cycle 2 (40.6%) to cycle 3 (44.12%). The experiment was conducted in three cycles, with an overview of the following results; (1) student motivation for obeying the lessons seen rising from their passion to try and count beam props beaded numbers that exist in the learning process, (2) increased student activity is illustrated by their compactness to solve problems or cases are given in groups them, (3) also increased their mastery of the concept seen from the mean value of the group they began to cycle 1 (35.8%), cycle 2 (40.6%) up to 3 cycles (44.12%).

**Keywords:** contextual teaching and learning, cycle, manic-manic of number

## 1. Introduction

Problem of education in Indonesia which emphasize on some points (Dikmenum, 2003): (1) the output of education is far from the expectation, (2) the significant point to be discussed and opened is the problem of learning method or the problem about the teacher quality, (3) learning method is expected to be suit with the paradigm and learning vision which suitable with the development(4) teacher and student should be more active, creative, autonomous and consider about the problem solving, (5) education is not only leaning on the academic potential, but also oriented on the way students can learn from environment, experience, and the greatness of other people, wealth and the wider of nature so that they can develop the creative behavior and imaginative thinking. Good curriculum and education facilities do not guarantee the education process will automatically be better too. It depends on the quality of teacher (Depdikbud, 1995).

The specific purpose of learn mathematics for the Junior High School students are students have knowledge as the supplies for the higher education level (Ekowati, 2002). In order to students have some skills as the increasing of basic education of mathematics in the daily life (Dikmenum, 2003). Martinus (1999, p. 3) stated that the interest of students toward the mathematics is not pleased. There are many students who do not like mathematics because it makes them bored and stagnant. As result the examination from year to year does not give the satisfaction result.

The reason why mathematics feels difficult is due to the fact that on the previous stage of education, for example the seventh grade of Junior High School Students, do not aware that they were not really comptence in matematics concept (misconception) and application (Ekowati, 2002). There is a tendency, to rethink that children are more serious in learning if the environment is still nature. Learning will be more meaningful if

students experience with what they learnt not what they known (Ekowati, 2008). Learning which orientated on the target mastery of material in short memorizes competition will success indeed but teacher will fail in support students to solve the problem in long period. This is the fact in Indonesian education.

Contextual approach is a concept which helps teachers to learn and to associate the content-studied with the real-world situations of students and encourage students to make connections between the knowledge possessed by its application in their lives as members of families and communities. With that concept, the outcome of learning is expected to be more meaningful for students. The learning process takes place naturally in the form of student activities and work experience, not a transferring of knowledge from teacher to student. Strategy of learning is more important than the outcome. As other learning strategies, contextual learning is developed with the aim to be more productive and meaningful. Contextual approach can be run without having to change the curriculum and the existing order.

The formulation of the problem in this study was: (1) how to implement contextual approach in teaching mathematics to students of class VII? (2) whether the class 7<sup>th</sup> grade student motivation can be enhanced through contextual approach? (3) how the class VII student achievement use the contextual approach?

## 2. Research and Methods

The method used in the study is Classroom Action Research- the type of research by providing action in a particular class (Moleong, 1991). The action is divided into several cycles. The study was conducted on students of class VII SMPN1 Kupang academic year 2011/2012. Classroom Action Research is being carried out in accordance with the material 3 cycles integers, where each cycle includes the planning/preparation, and execution phases of observation, reflection, and the last stage is not advanced stage. Research data was collected using the observation sheet student, teacher observation sheet, about the beginning of the test, the evaluation process and the results of tests at the end of each cycle (Sugiyono, 2013). Student observation sheet used to look at the motivation and follows the activities of students in the learning process. Teacher observation sheet used to see whether the teacher already implement the existing lesson plan using a contextual approach. The beginning of the test used to determine the students' initial abilities before using contextual approach. At the end of the test used to determine whether there is an increasing in student achievement when using a contextual approach or not. The data obtained at each cycle is used to reflect the learning has been done so it can be used as guidelines for follow-up agreement on the next cycle. Data were analyzed with descriptive qualitative indicator of success is the case of every student passing grade of at least 65% of the material during the course of the study integers occurred.

There are the characteristics of the contextual approach namely (Dikmenum, 2003): (1) constructivism which is the cornerstone of a contextual approach, a view that human knowledge is built little by little, the result is expanded through a limited context and not a suddenly context. Knowledge is not a set of facts, concepts or rules that are ready to be picked up and remembered. Human beings must construct knowledge and give meaning through real experience, (2) inquiring is the core of CTL based learning activities. Teachers should always design the program refers to activities of finding in any material that is taught, (3) questioning of the knowledge is always originated from asking. Asking is the main strategy of learning in CTL-based. Asking in learning is seen as an activity to encourage, guide and assess students' thinking skills. For students, the activities of asking is an important part in implementing the learning-based finding, internalize, and confirm what is already known and draw attention to the aspect that has not been known, (4) learning community which is on this concept suggest that the learning outcomes obtained from collaboration with others. Teachers are advised to implement learning in the groups study. Students are divided into groups whose members are heterogeneous where they can help one each other, (5) modeling is meant in a particular learning skills or knowledge; there are models that can be replicated. The model can be a teacher who teach how to operate something or doing something so that teacher can give the model of how to study, (6) reflection is also an important part of learning in the contextual approach, which is a way of thinking about what you've learned or thought to review of anything we've done in the past. Students precipitate what new knowledge learned as a new structure, as the enrichment or revision of previous knowledge. The meaningful knowledge gained from the process, (7) the authentic assessment is the process of collecting a variety of data that can provide an overview of student learning progress.

The results showed that students who have high achievement motivation will actually decrease motivation if they always meet with success in the task (Mohd, 2011). In class VII Semester 1, there are three standards of competence to be achieved, namely (Depdikbud, 1995): (1) perform arithmetic operations and the number which used in problem solving, (2) understand and can do the algebra operations, linear equations and inequalities one variable, the set and can use in problem solving, (3) understand and can use the properties and elements on line,

angle, flat wake and wake up space. To three competencies is still described in some basic competence and elaborated again in little subject matter.

### 3. Result and Discussion

#### Cycle 1

As a preliminary reflection materials for the application of cycle 1 starting from the results of preliminary observations made during the study of mathematics research takes place in the classroom and found a few things, among others are: (1) learning carried by teachers in general are less oriented to students, in which learning methods are applied and teachers do not encourage students to take an active role in the learning process, (2) teachers dominantly taught the mathematical concepts to students who have already finished, (3) students' lack of initiative to build knowledge based on their own knowledge. Based on these initial reflections, then acquired several problems, namely: (1) the ability of the basic concepts of mathematics students are very heterogeneous because they are derived from several primary schools with different qualifications, so that it becomes an obstacle for teachers to start learning, (2) is still low motivation and student learning activities in mathematics so that students tend to sit and listen (pasive) to any explanation of the teacher in the classroom. From both these problems, the learning achievement of students is low with the mean only 38.53%.

The plan of action in cycle 1 is the daily topic of using whole numbers, integer's layout and additional operations, subtraction, multiplication, and rank for the integers. This activity is planned in three meetings with the time allocation 5 hour lesson. Application of a class action in accordance with the Lesson Plan has been made between the researcher and teacher uses a contextual approach that available on students' work sheet. To assist teachers in the application of learning, it was observed by three observers who are peers of teachers using teacher observation sheet prepared by teachers and researchers.

Observations and reflections made by the observer obtained the following results: (1) students are not used to work in groups and students who have good competence do not share with students who are less and weak. Meanwhile the inactive and weak students were not creative to ask the students who really understand. So proactive students is still low, both in groups and in classical learning, (2) the interaction between students with students and students with teachers were not really good. The following is the summary of improvement integer concept mastery score in a group:

Group	Early Score	The Mean Score		Criteria
		Test Score	Ability Score	
1	33,00	69,10	30	Good enough
2	35,00	71,65	30	Good
3	39,00	79,35	30	Good
4	45,00	75,90	30	Good
5	36,00	75,15	30	Good
6	35,00	68,00	30	Good
7	42,00	80,60	30	Good
8	43,30	69,96	30	Good Enough

*Some notes:* as a result of the evaluation: There are students who have not mastered about the concepts of integers, for example:

- $-19 + 12 = 7$ , the correct result-7
- $38 + (-22) = -16$ , the correct result 16
- $-67 > -28$ , should sign <
- $70 < -100$ , should mark >
- $-8 \times (-12) = -96$ , the correct result 96
- $60 : (-5) = 12$ , the correct result-12

#### Cycle 2

Early reflections drawn from the observation and evaluation of the application of cycle 1, so some weakness in the first cycle can be minimized, namely: (1) students are given worksheets and understanding how to use it and

guided to solve problems encountered in the form of the group in accordance with the basic concepts and knowledge there, (2) the students given their views on how to learn or how to work in groups, where each member of the importance of collaboration and information between members in the group, (3) researchers and teachers try to monitor the whole group of learning by enabling students participate less in learning, so that an interaction can occur between members of the study group, (4) researchers try to motivate students in group work so that each member of the group actively participates in the group, (5) researchers encourage students who are less academic ability of students to be more active and not shy to ask both to fellow friends and the teachers, in order to create a harmonious interaction.

A plan of action for 2 cycles include determining material properties of multiplication and division of integers negative with negative and positive with the negative, because the material is less than the researchers plan on 1 meetings with 3 hours of lesson time needs. Application of the actions carried out in accordance with lesson plans designed by the researchers and their teachers with a focus on improving the weaknesses that occurred in cycle 1. Observation and evaluation on the combined cycle is obtained from the observation of actions 1 and 2, among others: (1) It appeared s the cooperation between the members of the group in solving the problems faced by the group, (2) some groups whose members are low-ability, is inactive quiet and does not want to solve the problems, (3) the interaction between students and students and students and teachers had been well occurred. The mastery of concepts of students learn in Cycle 2 is quite good with a mean score of 79.13. In this case student achievement has increased 40.6 % from the initial score of 38.55. The following summary is displayed mastery of concepts as a group of students in cycle 2

Group	Early Score	The Average Score		Criteria
		Test Score	Ability Score	
1	33,00	76,07	30	Good
2	35,00	78,40	30	Good
3	39,00	83,47	30	Good
4	45,00	76,13	30	Good
5	36,00	80,13	30	Good
6	35,00	75,07	30	Good
7	42,00	85,47	30	Very good
8	43,30	78,33	30	Good

Some notes as a result of the evaluation cycle 2: There are students who have difficulty in the concept of the properties of integer multiplication, for example:

- $8 \times (-6)$  fulfill the associative properties, the truth is the closed properties
- $[4 \times (-3)] \times (-5)$  fulfill the commutative properties, the correct is associative  $2 \times [12:(-2)] = 2 \times 6 = 12$ , which really is  $2 \times (-6) = -12$

### Cycle 3

Early reflections are based on the results of observation and evaluation of the application of cycle 2, namely (1) researchers and teachers should help students who are capable of low academic because they are embarrassed to ask with his own, (2) researchers and teachers should encourage students to work in group not only in the classroom, but also outside the classroom or at home. Action plan for cycle 2 includes material such as square, cube roots and cube roots of integers, which is planned in 2 meetings and takes 5 hours of lessons.

Application of actions performed using the lesson plans prepared by teachers and researchers with focus on improving the weaknesses that occurred in the previous cycles. The results of observation and evaluation cycle is described as follows: (1) the mastery of concepts students learn is good enough, (2) activity and student motivation is very satisfactory, (3) students interaction with students and students with teachers has optimally increased, (4) proactive students in group activities is good. Mastery of students concepts in learning on Cycle 3 quite well with a mean score of 82.65, increase of 44.12% from the initial mean score 38.53. The following is a recapitulation of mastery of concepts students learn in Cycle 3:

Group	Early Score	The Average Score		Criteria
		Test Score	Ability Score	
1	33,00	77,65	30	Good
2	35,00	83,40	30	Good
3	39,00	86,90	30	Very good
4	45,00	84,25	30	Very good
5	36,00	81,55	30	Good
6	35,00	79,55	30	Good
7	42,00	86,40	30	Very good
8	43,30	81,46	30	Good

Some notes as a result of the evaluation of the application of the 3 cycles are: There are students who are still difficult to distinguish and the estimated powers of integers, for example:

- $(-8)^2 = -64$ , supposedly 64
- $-52 = 25 - 25$  should
- Determine the estimated results of the calculation in dozens of nearby  $17 \times 12 = 20 \times 20 = 400$  supposed to be  $20 \times 10 = 200$
- Determine the estimated calculation results in hundreds of nearby  $252:14 = 200:20 = 100$ , should  $250:10 = 25$

Recapitulation level of student mastery of concepts individually integers from cycle 1 to cycle 3 diagramed as follows:

No Subject (1-41)	The mastery of Integer Concept			
	Early score	Cycles 1	Cycles 2	Cycles 3
Mean	38,78	73,68	79,11	82,62
		(34.9%)	(40.33%)	(43.84%)

#### 4. Conclusions and Recommendations

##### 4.1 Conclusion

Based on the above results there are several conclusions can be drawn such as:

- The application of a contextual approach to the material integers with manipulative beam number and beads number can increase the activity of students' motivation to learn.
- The use of manipulatives also can improve students' mastery of math concepts class VII SMPN1 Kupang.
- The application of a contextual approach to establish cooperation between the students and teacher in a harmonious relationship can stimulate students to think creatively in expressing the opinions, improving communication skills, responsibility, self-confidence and also building students' interest
- By applying a contextual approach, it can change the habits of teacher as a facilitator and mediator that becomes active and creative in improving student learning activities.

##### 4.2 Recommendations

In concederation on the findings above, the suggestions can be proposed by the researchers such as:

- In order to provide an overview of the principal to the teachers to apply a contextual approach to other subjects, as long as it suitable with the concept that will be discussed.
- The mathematics teacher always begins the process of learning mathematics by providing a contextual problem that has to do with the mathematical concepts that will be discussed.
- In order to optimize the use of mathematics manipulatives as a form of visual aids in lowering the real mathematical concepts.

## References

- Anonym. (2003). *Identify Characteristics of Students and Teachers (TOT Module Subject Teachers of Mathematics)*. Director General of Primary and Secondary Education Department of Education Jakarta.
- Depdikbud. (1995). *Subjects GBPP Mathematics*. Department of Education Jakarta.
- Director General of Primary and Secondary Education. (2003). *Contextual Approach (Contextual Teaching and Learning)*. Depdiknas Jakarta.
- Ekowati, K. C. (2002). Minimizing the frequency of misconceptions in teaching mathematics in a Constructivist Approach to Class I Junior High School I Kupang. *Media Exacta*, 3(1a).
- Ekowati, K. C. (2008). Implementation of Realistic Mathematics Education Students in Learning Mathematics Class V SDK St. Arnold Penfui Kupang NTT. *Jurnal Media Sains*, 6.
- Martinus, O. (1999). *Student Learning Disabilities (Research Report)*. Kupang.
- Mohd, N. (2011). Factors that Influence Student in Mathematics Achievement. *Introduction Journal of Academic Research*, 3(3).
- Moleong, J. L. (1991). *Qualitative research methodology*. Remaja Rosa Bandung.
- Sugiyono. (2013). *Educational Research Methods*. Alfabeta Bandung.

## Copyrights

Copyright for this article is retained by the author(s), with first publication rights granted to the journal.

This is an open-access article distributed under the terms and conditions of the Creative Commons Attribution license (<http://creativecommons.org/licenses/by/3.0/>).