Improving Whole Number Subtraction Ability Through Realistic Mathematics Education (RME) In First Grade Students of SDN Buaran 2
Abstract

The purpose of study to determine how to improve the ability of whole numbers subtraction ability through RME approach. Research done in first grade students of SDN Buaran 2 Tangerang Jakarta, Indonesia. The research method was Action Research with four cycles consisting of planning, implementation, observation and reflection. The study conducted in cooperation with classroom teachers. Data about learning process collected by check list and student's achievement data collected by test. The study found that contextual problem, mathematics tools and optimization of group work in the application of RME approach can improve the ability of the subtraction ability in whole numbers and foster students' positive attitudes towards mathematics. Key word: Subtraction ability, first grade students, RME

Introduction

Subtraction ability in whole numbers was still weak in first grade students. Students find it difficult to comprehend mathematical concepts and to construct and solve mathematical representation from a contextual (or story) problem, and the teaching style makes mathematics more difficult to learn and to understand.

Students have also become afraid of mathematics. It happened because in learning process: (1) teachers who have not been able to involve students actively, (2) Teachers do not use a tool or a medium of learning to facilitate students in finding their own concept of reduction, (3) There is no connection between mathematics and reality. According to Piaget's Stages of Cognitive Development, first grade students included at the concrete operational stage. During this stage, children begin to reason logically, and organize thoughts coherently (Cotton, 2010). However, they can only think about actual physical objects, and cannot handle abstract reasoning. They have difficulty understanding abstract or hypothetical concepts.

First grade students need teaching method suitable to their development like
Realistic Mathematics Education (RME) is largely determined by the views of Freudenthal (1991) who said that mathematics is not a subject that is ready to be for students, but rather a dynamic lesson can be learned by doing. Furthermore Freudenthal (1991) also states that "Mathematics is human activity". Realistic mathematics education approaches to school mathematics are widely recognized as providing one of the best and most detailed elaborations of the problem-based approach to mathematics education (Hadi dalam Sembiring, 2008). Originally developed in the Netherlands.

Inspired by the philosophy of RME, one group, later called the Pendidikan Matematika Realistik Indonesia (PMRI) Team, developed an approach to improve mathematics learning in Indonesian schools.

It is known as PMRI, an Indonesian adaptation of RME. It was developed through design studies in Indonesian classrooms, later becoming a movement to reform mathematics education in Indonesia. The movement does not just implement a new way of teaching and learning mathematics, but is associated with a drive to achieve social transformation within Indonesia (Sembiring, 2008). The approach to reform adopted by PMRI involves:

- a. bottom-up implementation;
- b. materials and frameworks based on and developed through classroom research;
- c. teachers being actively involved in designing investigations and developing associated materials;
- d. day-by-day implementation strategies that enable students to become more active thinkers;
- e. the development of contexts and teaching materials that are directly linked to school environment and the interests of students.

Several empirical studies show that learning mathematics use the RME approach, which can make:

1) math more relevant, interesting, and meaningful, not too formal and not too abstract;
2) consider the level of student ability;
3) emphasize the learning of mathematics in the 'learning by doing';
4) facilitate mathematical problem solving without the use of settlement (algorithm) standard;
5) use context as a starting point for learning mathematics. The use of RME approach in an elementary school classroom helps teachers to apply the mathematical concepts of arithmetic operations to students, especially subtraction operations in whole numbers, because the teacher can use a real learning environment or learning students can relate to everyday life. Teachers can teach math concepts by using a demonstration or model directly. Thus students are able to think in concrete terms before being able to think abstractly. Research Objectives Based on the background of the issue, the matter in this study is: "How to improve math skills through RME to teaching mathematics in grade school?"
Problem details are as follows: a. How can teacher preparation prior to implementing RME? b. How the implementation of RME approach in primary schools? c. What is the attitude of students towards mathematics after experiencing the learning of mathematics through RME? Methodology The study was conducted on students in first grade State Primary School Buaran 2 Serpong, South Tangerang, Indonesia. The study was conducted in second Semester, academic year 2011/2012. The experiment was conducted using action research methods consists of three cycles. Each cycle is described as follows: a. Planning. Researchers and observers create lesson plans and materials to be used in learning. In addition to the observation sheets were prepared to observe the learning process. b. Implementation. Researchers teach in accordance with the Lesson Plan and materials. c. Observation. Observer to observe the learning process includes the teacher, student activities, interaction between student and student, student and teacher interaction. d. Reflection. After learning, researchers and observers discuss the implementation of the learning process. In this case, discussed the progress achieved, obstacles in the implementation and efforts to overcome these obstacles. The data in this study is divided into two types, namely: (1) monitoring data action (action) collected by checklist, (2) students learning outcomes data (research) collected by test. Data were analyzed descriptively. Findings To achieve standards or teaching objectives in each, there should be improvements in the action research using RME. Observations indicate the presence of these improvements with indicated students achievements are increasing. Also learning activities increased. The progress from cycle to cycle can be seen in the following table: Table. 1 RME Implementation Observation No Cycle Score 1. I 62% 2. II 70% 3. III 85% While the development of students' skills from 1st cycle I to 3rd cycle can be seen in the following table: Table. 2 Students Achievement No Data 1st Cycle % 2nd Cycle 3rd Cycle 1 Score < 70 68% 42% 11% 2 Score > 70 32% 58% 89% 3 Class average 55 68 77 Based on the table above can be concluded that the increase in the learning process is followed by an increase in students subtraction ability in each cycle. First cycle students reached a value above 70 is 32%, in the second cycle increased to 58% and the third cycle reached 89%. Discussion Student's subtraction ability in whole numbers increased after the 3rd cycle. Especially during the implementation of the modeling. Modeling in this study had a very important contribution to building the concept of student learning about subtraction, where the modeling is done by students. Students modeling in first cycle still seen a lot of shortcomings, it is because students are not accustomed to learning with RME. Students are confused to present problem model of subtraction therefore many students asked the teacher. But in the second cycle modeling activities of students are increasing, students are able to develop their thinking power to model the problem, and the third cycle students model more better. Students are no longer much to ask teachers and they made it confidence because of their experience of the previous cycle. The second point that play important role in this research is group work or discussion. Through group discussion the students had many learning experiences in which students sharing their ideas in group. This discussion helpful in increasing students' ability in subtraction operation in whole numbers, it can be seen from the liveliness of the students express ideas and knowledge. 1st cycle on these discussions lead to some students cry because struggle for materials. They want to work on their own assigned tasks and didn't discuss with members of the group. Significant changes occur in 3rd cycles where the students are able to work together in a group without fighting and working collaboratively. Students performance when present their group works in front of class increased. This is apparent in every cycle in which students learn to read and comment on their own work which will help students to remember their own
concept of subtraction as a direct result of learning. 1st Cycles and 2nd cycle the percentage of activity is still deficient, especially in cycle I, they still ask for referrals of teachers to speak and no one wants to respond to the presentations. But it turned in 3rd cycle the capable of students presentation become better, their communicate use simple language that is understandable to them. Teachers keeps motivated students because it gives students good stimulus in learning process by asking the question on all students, and threw question to others with an easy to them to understand and 192 discussed. RME give a lot of progress in learning activities that impact on improving students' abilities. RME also ultimately have an impact in terms of students' affective, the students became more excited and happy, especially seen in the group discussion using materials. and by the time students get rewards from teacher. Teachers also get a new experience when implementing RME. The role of teacher as facilitators who provide direction, motivation and feedback


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