

# Improving Learning Outcomes of Mathematics Lesson through Roman Numeral Puzzle

R. Kartini

SD Negeri Purwodadi 01 Malang City  
Malang, Indonesia  
geometrimolekul@yahoo.co.id

**Abstract**— Mathematics is basic subject that must be taught from elementary to senior high school. Mathematics at elementary school level is a foundation for further school, so it brings a very important role and students have to get deep and strong knowledge about it in order that they will like mathematics subject in life. In this class action research, the researcher displayed the activity of mathematics learning with Roman Numeral Puzzle medium. The main object taught in this study is to change the whole numbers to Roman numerals, or vice versa. In studying Roman numerals, students do not need a math-like count as in general, but require memory about the rules of Roman numerals writing. This is based on children mindset that still love playing. This puzzle game is already known by students, so the teacher does not need to explain in detail how to use this game. Based on the rules applied in this game, pieces of puzzle are placed upside down, so they look roman numerals. Pieces of puzzle will be paired or matched with whole numbers that exist on the rectangular board. If the pieces of puzzle have filled the rectangular board correctly, there will be visible image that can be seen clearly by students. Thus, students have paired or matched precisely Roman numerals with whole numbers. In this game, students do not only play, but they also learn by pairing whole numbers with Roman numerals. This game can be presented in form of fast and precise competition, so it will bring up a healthy competition for students. The research results show that there is an increase of students' learning outcomes. At the first cycle, there were 24 students who have scores above minimum completeness criteria or about 75%. At the second cycle, there were 28 students who have scores above minimum completeness criteria or about 87.50%.

**Keywords**— learning result, Mathematics, Roman numeral puzzle

## I. INTRODUCTION

Teaching and learning process nowadays have used interesting models and even schools have actively conducted school-based lesson studies. However, since there are so many diverse students' abilities and family backgrounds, maximum learning outcomes have not yet received. Especially for mathematics lesson, year by year it is still far away from satisfactory. Students still think that Mathematics lesson is difficult and scary [1]. The data that the researcher got from fourth grade teacher showed that in every exam, the number of students who have passing grade scores is still below 75% of the total students in class [2].

Students' activity in learning process is still limited in asking question to verify the answer of works being done. Conceptual questions that indicate a high level of understanding and thinking ability have not been visible. This condition is also supported by lack of learning media commonly used by teachers while implementing learning process. One such obstacle is caused by lack of teachers' understanding about benefits of learning media, mainly in producing and utilizing of simple but innovative learning media [3]. Teachers must have creativity to create their own learning media [4]. Teachers' certification budget can be utilized by them to improve learning process by procuring laptops and attending computer training so that teachers will be more creative to use modern media into learning [5]. One of the media is laptop or Roman numeral puzzle game.

Mathematics lesson about Roman numerals in elementary school is only studied in fourth grade, especially in second semester [6]. The way of writing Roman numerals should be studied because it is different from original numbers [7]. The results of students' exam about Roman numerals show that the average score of class was 76, but there were 14 or 43.75% students who have scores under minimum passing criteria and 18 or 56.25% students who have scores above minimum passing criteria. Target to be achieved by teacher is 100% students mastering Roman numerals.

## II. METHOD

This research was conducted at an elementary school in Malang city where the researcher teaches, that is SD Negeri Purwodadi 01. SD Negeri Purwodadi 01 is located in Blimbing District, Malang City and becomes one of the primary schools in urban axis of Malang. Students come from area around the school and also from Malang Regency. There are 330 students who are divided into 11 classes. The research was implemented in April 2015, in which precisely first cycle was held on April 6th-11th, 2015, while second cycle was held on April 20th-25th, 2015. This research was conducted on fourth grade students of SD Negeri Purwodadi 01 which amounted to 32 students, consisting of 19 male students and 13 female students.

Each cycle consisted of two stages and done in one meeting. Stages of each cycle are (1) preparing activity plan; (2) taking action; (3) doing observation; (4) making analysis

and reflection [8]. In this case, the researcher performed teaching while the one who acted as an observer was a colleague [9]. Data were derived from activities relating to learning Roman numeral at fourth grade students of SD Negeri Purwodadi 01 Malang. The data obtained in the research referred to the results of students' behavior record during mathematics lesson and students' exam about Roman numeral.

**III. RESULTS AND DISCUSSION**

The learning outcome for first cycle and second cycle is presented in Table 1 and Table 2.

TABLE 1. LEARNING OUTCOME OF FIRST CYCLE

| Students' Scores | Number of Students |
|------------------|--------------------|
| ≤ 60             | 4                  |
| 61-70            | 3                  |
| 71-80            | 1                  |
| 81-90            | 10                 |
| 91-100           | 13                 |

TABLE 2. LEARNING OUTCOME OF SECOND CYCLE

| Students' Scores | Number of Students |
|------------------|--------------------|
| ≤ 60             | 0                  |
| 61-70            | 4                  |
| 71-80            | 2                  |
| 81-90            | 6                  |
| 91-100           | 20                 |

Comparison of Students' Scores between First and Second Cycles

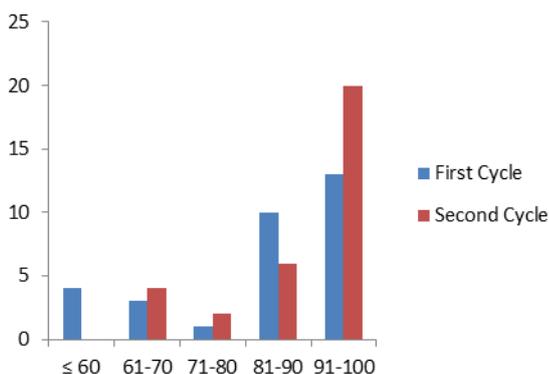


Fig 1. The Comparison of Students' Scores between First and Second Cycles

The results of learning analysis from first cycle showed that there were 24 of 32 (75%) students who had scores above minimum passing criteria. In second cycle, there were 28 of 32 87.50% students who got scores above minimum passing criteria. Students become more excited while learning and at the same time playing, because basically elementary school students are still happy with various types of games. Although in this Roman numerals puzzle game the students are required to fully concentrate in finding the pair of whole numbers and Roman numerals correctly, all of them were able to perform well.

**IV. CONCLUSION**

Roman numeral puzzle is very suitable for use in mathematics lesson, especially in Roman numeral material [10]. This can be seen from students' participation during learning process. The use of Roman numerals puzzle can also increase students' motivation while attending learning process. The analysis of learning completeness results reveals that the use of Roman numerals puzzle gives a significant impact on improving students' understanding of the concepts being learned, so learning outcomes of fourth grade students in SD Negeri Purwodadi 01 Malang can be improved.

**ACKNOWLEDGMENT**

My gratefulness goes to Mrs. Dra. Zubaidah, M. M. as the Head of Education Office in Malang City who always motivates the researcher to always innovate, Mr. Drs. Didik Bkti, M. Pd, as the supervisor of 7th Cluster of Blimbing District, Malang City who always motivates the researcher to always be creative and work for professionalism improvement, all Teachers of SD Negeri Purwodadi 01 Malang who help the researcher, and all students of fourth grade SD Negeri Purwodadi 01 Malang.

**REFERENCES**

- (1) N. Sudjana, Penilaian Hasil Proses Belajar Mengajar, Bandung: PT. Remaja Rosdakarya, 1990.
- (2) Dirjen, Kurikulum Tingkat Satuan Pendidikan, Jakarta: Departemen Pendidikan Nasional, 2006.
- (3) D. J. Latuheru, Media Pembelajaran, Jakarta: P2LPTK, 1988.
- (4) K. Kasbollah, Penelitian Tindakan Kelas, Malang: RUT VI. Lembaga Ilmu Pengetahuan Indonesia, 1999.
- (5) Suciati, Belajar dan Pembelajaran, Jakarta: Universitas Terbuka, 2007.
- (6) R. J. Soenarjo, Matematika 5, Jakarta: JePe Press Media Utama, 2008.
- (7) G. Muhsetyo, Pembelajaran Matematika SD, Jakarta: Universitas Terbuka, 2007.
- (8) Moleong, Metodologi Penelitian Kualitatif, Bandung: PT. Remaja Rosdakarya, 2002.
- (9) T. R. Kemmis, The Action Research Planner, Victoria: Deakin University Press, 1988.
- (10) Purwodarminto, Kamus Besar Bahasa Indonesia, Jakarta: Departemen Pendidikan Nasional, 1991.