STUDENTS' STRATEGIES IN COMPARING RATIONAL NUMBERS

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ABSTRACT

There are many strategies in comparing rational numbers. Based on the observation, there was some students who used wrong strategies in comparing rational numbers. To fix this students problems, it was necessary to know that the original concept of them. So the objective of this research was to describe student's strategies in comparing rational number. The results showed that in comparing rational number, students used same form strategy, students make the number in the same form and then compare it by used number line and also, other students used whole number thinking strategy.

Keywords: student's strategies, comparing rational numbers

INTRODUCE

Research of Trends International Mathematics and Science Study (TIMSS) (Mullis et al 2012: 42) indicates that the ability of Indonesian students regarding the number is low. This statement also supported by the observations at SMP Laboratorium UM which indicate that there are some students who have errors in comparing rational numbers. Similar results are also published by Clarke & Roche (2009); Nunes & Bryant (2008); Sengül (2013); and Fuchs et al (2013). They show that there are many student misconceptions in comparing fractions. Further, Steinle (2004); and Roche (2005) found that in comparing decimal numbers students also often made similar errors.

Furthermore, the observation results also found that many errors of student concepts in comparing the numbers of different types. The student's conceptual error in comparing rational numbers is also explained by Stacey et al (2001) and Reinup (2010).

It is very important for students to understand the concept of number to minimize the misconceptions, particularly in comparing rational numbers. Allen (2007) states that a "minor" mistake in understanding mathematical concepts would had a huge impact. A single misconception that ignored will make miscalculation on the completion of more complex subject.

Allen (2007) explained that to correct the students' misconceptions, teacher need to know their concept first. The concept can be known by observing the strategies used by the students. As revealed by Steinle (2004) that misconceptions are closely related to student strategy because inappropriate strategies lead to misconceptions. Knowledge of student strategies can help teachers know what kind of misconceptions that students' had.

RESEARCH METHOD

This research aims to describe students' strategy in comparing rational numbers. The subjects of the study were 6 students of grade VII of SMP Laboratorium UM year 2014/2015 which is selected each of two students from high-ability, moderate and low-ability category based on their score in comparing numbers instrument and have good communication skills according to the teacher.

The instruments used in this study consisted of written and interview instruments. Written instruments are given to 40 students to measure students' score in comparing rational numbers. While interview instruments are used on the six subjects that have been selected. The instruments were validated by two validators. The data is valid if student answers on both instruments are the same.

RESULT AND DISCUSSION

Table 1 Categorization of Students Strategies in Comparing Rational Numbers

Group	Subject	Students Strategies in Comparing Rational Numbers
I	S_1	Convert to fractions strategy
	S_2	Convert to decimals strategy
II	S_3	Convert to fractions strategy
	S_4	Number line strategy
III	S_5	-
	S_6	Whole number thinking strategy

Table 1 shows that S_1, S_2 and S_3 first equate the types of numbers. This type of comparing numbers is also mentioned in Reinup (2010). S_1 and S_3 use “convert to fractions” strategy (Clarke & Roche, 2009) because they realize their inability to convert fractions into decimal. Instead, S_2 uses a “convert to fractions” strategy because S_2 finds it difficult to do the opposite.

Otherwise, S_4 compares the different types of rational numbers by using a number line strategy. S_4 imagine the position of rational numbers on the number line. While the other subject, S_5, revealed its obstacles in comparing rational numbers with different types. According to him, the comparison of different types of numbers is too difficult. This is because the forms of both numbers is different.

In contrast, according to S_6, comparing numbers means comparing the digits of the numbers. This strategy is also called whole number thinking strategy. He compared the different types of rational numbers by paying attention to the numerator, denominator and the digits behind the comma separately. According to him, the numerator and denominator on the fraction can be compared to the digit behind the comma. If the numerator/denominator is larger, then the fraction will be greater than the decimal number. Conversely, if the numbers behind the comma are smaller, then the decimal number will be less than the fraction.

CONCLUSION

Students used various strategies in comparing different types of rational numbers. The strategy used by students is the strategy of equating the form of numbers, number line strategy and whole number thinking strategy. The whole number strategy which is tend to be used by low-ability students is a wrong strategy and must be fixed by the teacher immediately.

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