

Supporting Students' Understanding of Percentage

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Abstract

Many researches revealed that pupils often find difficulties to understand percentage although they are able to recite percent as per hundred and carry out the computations correctly. This might happen due to the way in which the learning percentage has been taught that tends to focus on procedures and recall instead of getting a real understanding of percentage. In Realistic Mathematics Education approach, in which the basic concept is rooted from Freudenthals' idea, mathematics is the activity of organizing matter from reality. Therefore, mathematics should be experientially real for the students. Consequently, in this research the instructional activities were designed through exploring some contextual situations in which percentages play role.

Therefore, this research aimed to develop a local instructional theory to support students to extend their understanding of percentage. This research used design research method as an appropriate means to achieve the research aim. The research involved students and mathematics teachers of grade 5 in SD Laboratorium UNESA and SD BOPKRI III Demangan Baru Yogyakarta.

Keywords: design research, percentage, understanding, contextual situations

Abstrak

Banyak penelitian mengungkapkan bahwa siswa sering menemukan kesulitan untuk memahami persentase meskipun mereka mampu melafalkan persen per seratus dan melakukan perhitungan dengan benar. Hal ini dapat terjadi karena cara di mana persentase belajar telah diajarkan yang cenderung fokus pada prosedur dan ingat bukan mendapatkan pemahaman yang nyata dari persentase. Dalam pendekatan pembelajaran matematika realistik, dimana konsep dasar berakar dari ide Freudenthals, bahwa matematika adalah kegiatan pengorganisasian materi dari kenyataan. Oleh karena itu, matematika harus berdasarkan pengalaman nyata bagi siswa. Akibatnya, dalam penelitian ini kegiatan instruksional yang dirancang melalui mengeksplorasi beberapa situasi kontekstual dimana persentase berperan.

Oleh karena itu, penelitian ini bertujuan untuk mengembangkan teori instruksional lokal untuk mendukung siswa untuk memperluas pemahaman mereka tentang persentase. Penelitian ini menggunakan metode desain penelitian sebagai sarana yang tepat untuk mencapai tujuan penelitian. Penelitian ini melibatkan siswa dan guru matematika

kelas 5 di SD Laboratorium UNESA dan SD Bopkri III Demangan Baru Yogyakarta.

Kata kunci: *design research*, persentase, pemahaman, pengetahuan awal, situasi kontekstual

Percentage is one of the most widely used mathematical topics in daily life and holds substantial place in the school curriculum for almost any science and social studies (Arthur J. Baroody et al, 1998; James E. Schwartz et al, 1994; Parker and Leinhardt, 1995). Understanding of percentage is necessary to ensure proper interpretation of social studies, science materials, and many situations in daily life (James E. Schwartz et al, 1994). Percentages are not only another way of writing down simple fractions, but also derive their right to exist from the limitations of regular fractions; fractions are difficult to compare with each other, and the scale that they provide is rather unrefined (Galen et al, 2008).

Considering the importance of percentage in daily life, percentage has been taught since elementary school. However, many percentage problems indicate that education is primarily focused on procedures and recall instead of getting a real understanding of percentage (Van den Hauvel-Panhuizen, 1994). The finding in the study of Koay (1998) shows that ability to recite percent as per hundred and carry out the computations correctly does not lead to the ability to interpret and apply the concept in context. It is easier for students to perform computation problems than to explain the meaning of percent and also knowledge of percent was often rigid and rule-bound (Koay, 1998).

In Realistic Mathematics Education where teaching is built on the informal knowledge of the students, it is important to give students the opportunity to explore some daily life situations in which percentages play a role (Van den Hauvel-Panhuizen, 2003). This idea is relevant with Freudenthal's idea that views mathematics as a human activity instead of seeing mathematics as a subject to be transmitted (Freudenthal, 1991). Therefore, mathematics should be experientially real for students. There are some daily life situation problems that can be used as the contextual problems for students to learn percentage. Some of those are loading process, discount, and free extra context.