

## **Students' Modelling in Learning The Concept of Speed**

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### ***Abstract***

Previous researchs shows that speed is one of the most difficult in the upper grades of primary school. It is because students must take into consideration of two variables; distance and time. Nevertheless, Indonesian students usually learn this concept as a transmission subject and teacher more emphasizes on formal mathematics in which the concept of speed given as "distance by time" rigorously. A sequence of learning activities with toy cars context was designed based on students' development and Realistic Mathematics Education (RME) principles which are guided reinvention, didactical phenomenology and emergent modelling. Using their own models, students are able to explain a proportion among distance and time in speed as well the relationship of it.

**Key words:** The concept of speed, design research, Toy cars, context, 'ratio table' model

### **Abstrak**

Penelitian-penelitian terdahulu menunjukkan bahwa kecepatan merupakan salah satu konsep yang sangat sulit untuk dipelajari oleh siswa di tingkat akhir sekolah dasar karena siswa harus memperhatikan dua besaran yang berbeda dalam waktu yang bersamaan yaitu jarak dan waktu. Akan tetapi, siswa Sekolah Dasar di Indonesia biasanya mempelajari konsep kecepatan ini sebagai subjek yang diberikan oleh guru dan guru lebih menekankan pada matematika formal dengan memperkenalkan rumus kecepatan ; kecepatan diperoleh dengan membagi jarak dengan waktu. Serangkaian aktifitas pembelajaran dengan konteks mobil mainan didesain berdasarkan perkembangan siswa dan beberapa prinsip Pendidikan Matematika Realistik yaitu 'guided reinvention' (penemuan terbimbing), didactical phenomenology (fenomena yang mengandung muatan didaktik), serta pemunculan/penggunaan model. Dengan model yang dikembangkan sendiri, siswa mampu menjelaskan perbandingan antara jarak dan waktu sekaligus menyelesaikan masalah yang berkaitan dengan hubungan antara jarak, kecepatan dan waktu.

**Kata Kunci:** konsep kecepatan, design research, cerita fabel Indonesia, mobil mainan, konteks, model 'ratio table'

The concept of speed is introduced to the students since in elementary school. It may with the consideration that speed is a fundamental concept for learning kinematics in junior high school as well calculus in the higher education. However, according to Gravemeijer, et al (2007) the concept of speed is one of the most difficult in the upper