

DEVELOPING MATHEMATICS PROBLEMS BASED ON PISA LEVEL

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Abstract

This research aims to produce mathematics problems based on PISA level with valid and practical content of change and relationships and has potential effect for Junior High School students. A development research method developed by Akker, Gravemeijer, McKenney and Nieveen is used in this research. In the first stage, the researcher analyzed students, algebra material in school-based curricula (KTSP) and mathematics problems of PISA 2003 of change and relationships content. The second stage, the researcher designed 13 problems with content of change and relationships. The last, the researcher used formative evaluation design developed by Tessmer which includes self evaluation, one-to-one, expert review, small group, and field test. The data collected by walk through, interview, and questionnaire. The result of this research indicated that 12 mathematical problems based on PISA level of change and relationships content that developed have validity, practicality, and potential effects for Junior High School students.

Keywords: Development Research, Mathematical Problems Based on PISA Level, Change and Relationships

Abstrak

Penelitian ini bertujuan untuk menghasilkan soal matematika model PISA konten change and relationships yang valid, praktis, dan memiliki efek potensial bagi siswa Sekolah Menengah Pertama (SMP). Adapun metode penelitian yang digunakan dalam penelitian ini adalah metode penelitian pengembangan yang dikembangkan oleh Akker, Gravemeijer, McKenney dan Nieveen. Pada tahap pertama, peneliti menganalisis siswa, menganalisis Kurikulum Tingkat Satuan Pendidikan (KTSP) materi aljabar, dan menganalisis soal matematika PISA 2003. Pada tahap kedua, peneliti mendesain 13 butir soal matematika model PISA konten change and relationships. Terakhir, peneliti menggunakan desain formative evaluation yang dikembangkan oleh Tessmer yang meliputi *self evaluation*, *one-to-one*, *expert review*, *small group*, dan *field test*. Teknik pengumpulan data yang digunakan dalam penelitian ini adalah *walk through*, wawancara, dan angket. Adapun hasil penelitian ini menunjukkan bahwa peneliti menghasilkan 12 soal matematika model PISA konten change and relationships yang valid, praktis, dan memiliki efek potensial bagi siswa SMP.

Kata kunci: Penelitian Pengembangan, Soal Matematika Model PISA, *Change and Relationships*

In PISA mathematics problems, there three prominent components; content, contexts, and competence, included in those problems. Content is a component in which materials are taught at school. Context is a situational problem in daily life. A competence represents students' ability to formulate, employ, and interpret mathematics in solving problems.

Those three components could not be found in such integrative way in problems, for instance on *Buku Sekolah Elektronik (BSE)*. On BSE, problems used still question abstract problems, formulas,