

## Developing the Sixth Level of PISA-Like Mathematics Problems for Secondary School Students

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### *Abstract*

Indonesia's involvement in the Programme for International Student Assessment (PISA) is one attempt to see how far the development of educational programs in our country compared to other countries in the world. PISA results show that Indonesia is still at the lower level. This means that the ability of Indonesian students in solving problems that require the ability to review, giving reasons and communicating effectively, and solve and interpret problems in various situations is still lacking. This may be due to government policy in the presence of the National Examination (UN) in which the spread of the UN's questions are still at the lower levels of cognitive aspects that are not in line with government regulations on curriculum which suggests that the fulfillment of cognitive aspects as one of the important aspects of education. To that end, researcher conducted a study that aims to produce valid and practical the sixth level of PISA-like mathematics problems for middle school students. This study is the development research formative evaluation type. The research subjects are ninth grade students SMP Negeri 1 Palembang. Data collection techniques used are walk through, documentation, interviews, and tests. From the analysis it can be concluded that this research has resulted a product the sixth level of PISA-like mathematics problems. At the stage of expert review, an expert and two colleagues evaluated the problems from different aspects. Trying out at one-to-one and small group was performed on students with different mathematical abilities. Then at the field test stage, 26 students in one class answered the questions that were developed.

**Keywords:** development research, PISA questions, development the sixth level of PISA-like mathematics problems

### Abstrak

Keterlibatan Indonesia dalam *Program International for Student Assessment* (PISA) adalah salah satu upaya untuk melihat sejauh mana perkembangan program pendidikan di negara kita dibandingkan dengan negara-negara lain di dunia. Hasil PISA menunjukkan bahwa Indonesia masih berada pada level bawah. Ini berarti bahwa kemampuan siswa Indonesia dalam menyelesaikan soal-soal yang menuntut kemampuan untuk menelaah, memberi alasan dan mengomunikasikannya secara efektif, serta memecahkan dan menginterpretasikan permasalahan dalam berbagai situasi masih sangat kurang. Hal ini mungkin disebabkan kebijakan pemerintah dengan adanya Ujian Nasional (UN) di mana penyebaran soal UN masih berada pada level bawah dari aspek kognitif yang tidak sejalan dengan peraturan pemerintah mengenai KTSP yang mengisyaratkan agar

terpenuhinya aspek kognitif sebagai salah satu aspek penting dalam pendidikan. Untuk itu, peneliti melakukan penelitian yang bertujuan untuk menghasilkan soal matematika model PISA level 6 untuk siswa sekolah menengah pertama yang valid dan praktis. Penelitian ini adalah penelitian pengembangan (*development research*) tipe *formative evaluation*. Subjek penelitian adalah siswa kelas IX SMP Negeri 1 Palembang. Teknik pengumpulan data yang digunakan adalah *walk through*, dokumentasi, wawancara, dan tes. Dari hasil analisis dapat disimpulkan bahwa penelitian ini telah menghasilkan suatu produk soal matematika model PISA level 6. Pada tahap *expert review*, tiga orang pakar dan teman sejawat mengevaluasi dari aspek yang berbeda. Uji coba soal pada tahap *one-to-one* dan *small group* dilakukan pada siswa dengan kemampuan matematika yang berbeda. Pada tahap *field test*, 26 orang siswa dalam satu kelas menjawab soal-soal yang dikembangkan.

**Kata Kunci:** penelitian pengembangan, soal PISA, pengembangan soal matematika model PISA level 6

### ***Introduction***

Development of science and technology is faster and faster, especially on information and communication scope so that human resources that are reliable and able to compete globally are necessary. Indonesian students should be able to compete with other students from various countries in the face of the current era of globalization. Various tests conducted internationally can be used as a benchmark to determine the extent to which Indonesian students competing in the globalization era. The results of these tests are often used as a basis for program development and improvement of education quality. Indonesia's involvement in the Programme for International Student Assessment (PISA) is one attempt to see how far the development of educational programs in our country compared to other countries in the world.

PISA results show that Indonesia is still at the lower level. Of the 65 participating countries in PISA 2009, Indonesia occupied the position 61<sup>st</sup> for PISA mathematics. This means that the ability of Indonesian students in solving problems that require the ability to review, giving reasons and communicating effectively, and solve and interpret problems in various situations is still lacking. Based on the results of PISA mathematics in 2009 (Stacey, 2010), only 0.1% of Indonesian students are able to solve problems for the two top level in PISA.

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