

ABSTRACT

Heffi Alberida. 2019. " The Development of a Problem Solving Model to Improve Science Process Skills in Junior High School Students". Dissertation. Postgraduate Program of Padang State University.

Problem solving skills plays important role important for students to be successful in the 21st century as well as in working world and daily life, and this ability needs to be trained. The Science learning in Junior High School (JHS) is based on the 2013 Curriculum by using scientific approach. However, some of the scientific problem solving steps are not compatible for JHS students, so it needs to develop by using problem solving models with scientific steps. The aims of the present study are producing valid, practical, and effective problem solving models on science learning.

In the present study, the problem solving models on science learning was developed by using the ADDIE model (Analyze, Design, Develop, Implement, and Evaluate). The instrument for gathering data is observation sheets, questionnaires and question sheets. The product was validated by experts and tested to JHS students' in Padang City, West Sumatra, Indonesia who had implemented the 2013 Curriculum in the 2015/2016 school year. The quantitative data is obtained through questionnaires and test sheets, and the qualitative data through observations, responses and suggestions for improvement in writing form. The practicality of the learning model is determined based on the process of learning, teacher responses and student responses. While the effectiveness of learning model is determined by student activities, science process skills and aspects of knowledge. The implementation of learning data and product effectiveness were obtained through experimental research by using a randomized control group pretest-posttest design. The limited trial was conducted at JHS 12 Padang, and broad trials at several schools, including JHS 1, JHS 12 and JHS National Padang. The validity, practicality and student activities data were analyzed using the Cohen's Kappa formula and percentage. The science process skills and aspects of knowledge data were analyzed by U Mann-Whitney test using SPSS 19.

The results of this study have shown that problem solving model for science learning which is developed in the present study is valid, practical and effective for JHS student. The development products were outline into 4 (four) following books, which are declared valid by the validators: problem solving model book for science learning; student book; teacher books and student worksheet. Based on the implementation learning on all categories in the present study, the problem solving were declared easy and practical by JHS teachers and students. This model is proven effective based on the activities of students who are in the very active category, and based on the improvement of science process skills as well as students' knowledge competencies. Based on these findings, the author recommended to JHS teachers to be able to use this problem solving models in science learning in junior high school.

ABSTRAK

Heffi Alberida. 2019. "Pengembangan Model *Problem Solving* untuk Meningkatkan Keterampilan Proses Sains Siswa pada Pembelajaran IPA SMP". Disertasi. Pascasarjana Universitas Negeri Padang.

Problem solving termasuk dalam keterampilan abad 21 yang penting dimiliki siswa agar sukses dalam dunia kerja maupun kehidupan sehari-hari, sehingga perlu dilatihkan. Pembelajaran IPA SMP sesuai Kurikulum tahun 2013 menggunakan pendekatan ilmiah. Selain itu tidak semua langkah-langkah saintifik *problem solving* sesuai untuk siswa SMP, oleh sebab itu perlu dikembangkan model *problem solving* yang menggunakan langkah-langkah ilmiah. Penelitian ini bertujuan untuk menghasilkan model *problem solving* untuk pembelajaran IPA yang valid, praktis, dan efektif.

Pengembangan model *problem solving* untuk pembelajaran IPA menggunakan model ADDIE (*analyze, design, develop, implement, dan evaluate*). Instrumen pengumpul data berupa lembar observasi, angket dan lembar soal. Produk divalidasi oleh pakar dan diujicobakan pada siswa SMP Kota Padang yang telah menerapkan Kurikulum tahun 2013 pada tahun ajaran 2015/2016. Data kuantitatif diperoleh melalui angket dan lembar tes. Data kualitatif diperoleh melalui observasi, tanggapan dan saran perbaikan yang diberikan secara tertulis. Praktikalitas model pembelajaran ditentukan berdasarkan keterlaksanaan pembelajaran, respons guru dan respons siswa. Sedangkan efektivitas model pembelajaran ditentukan dari aktivitas siswa, keterampilan proses sains dan aspek pengetahuan. Data keterlaksanaan pembelajaran dan efektivitas produk diperoleh melalui penelitian eksperimen dengan rancangan *randomized control-group pretest-posttest design*. Uji coba terbatas dilakukan di SMPN 12 Padang. Uji coba diperluas dilakukan di SMPN 1, SMPN 12 dan SMP Nasional Padang. Data validitas, praktikalitas serta aktivitas siswa dianalisis menggunakan formula Cohen's Kappa dan persentase. Data peningkatan keterampilan proses sains dan aspek pengetahuan dianalisis dengan *U Mann-Whitney test* menggunakan bantuan SPSS 19.

Dari hasil pengembangan dihasilkan model *problem solving* untuk pembelajaran IPA yang valid, praktis dan efektif. Produk yang dikembangkan dituangkan dalam 4 (empat) buku yaitu: buku model *problem solving* untuk pembelajaran IPA; buku siswa; buku guru dan LKPD. Buku model, buku siswa, buku guru, serta LKPD dinyatakan valid oleh validator. Model *problem solving* dinyatakan praktis berdasarkan keterlaksanaan pembelajaran dengan kategori semua terlaksana dan dinyatakan praktis baik oleh guru maupun siswa. Model *problem solving* terbukti efektif berdasarkan aktivitas siswa yang berada pada kategori sangat aktif, serta berdasarkan peningkatan keterampilan proses sains serta kompetensi pengetahuan siswa. Berdasarkan temuan ini direkomendasikan kepada guru-guru untuk dapat menggunakan model *problem solving* dalam pembelajaran IPA di SMP.