DESAIN DIDAKTIS SISTEM PERSAMAAN LINIER DUA VARIABEL UNTUK SISWA SEKOLAH MENENGAH PERTAMA

TESIS

Diajukan untuk memenuhi sebagian syarat untuk memperoleh
gelar Magister Pendidikan Program Studi Pendidikan Matematika

oleh
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PROGRAM STUDI S2 PENDIDIKAN MATEMATIKA
FAKULTAS PENDIDIKAN MATEMATIKA DAN ILMU PENGETAHUAN ALAM
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ABSTRAK

"Desain Didaktis Sistem Persamaan Linier Dua Variabel untuk Siswa Sekolah Menengah Pertama"

Nilam Manik Malela (2010289). Program Studi Magister Pendidikan Matematika. Fakultas Pendidikan Matematika dan Ilmu Pengetahuan Alam. Universitas Pendidikan Indonesia.

Sistem Persamaan Linier Dua Variabel merupakan salah satu topik penting dalam mata pelajaran matematika. Meskipun demikian, terdapat hambatan belajar saat siswa mempelajari topik ini. Penelitian ini bertujuan untuk mengatasi hambatan belajar siswa pada materi ini. Penelitian ini adalah penelitian kualitatif dengan menerapkan penelitian desain didaktis berdasarkan pada teori situasi didaktis oleh Brousseau. Hasil analisis *learning obstacles* menunjukkan bahwa jenis kendala siswa termasuk dalam *ontogenical obstacle*, *didactical obstacles*, dan *epistemological obstacle*. *Ontogenical obstacles* terjadi ketika siswa kesulitan dalam melakukan perhitungan bilangan bulat, membuat grafik linier, dan membuat model matematika dari masalah kontekstual. *Didactical obstacles* terjadi saat siswa melakukan kesalahan ketika memilih konstanta pengali untuk kedua persamaan dalam sistem. Siswa hanya mengikuti langkah-langkah pada metode eliminasi tanpa memahami tujuan melakukan metode tersebut. *Epistemological obstacle* terjadi ketika siswa tidak bisa menginterpretasikan solusi Sistem Persamaan Linier Dua Variabel. Berdasarkan analisis *learning obstacles* dan *hypothetical learning trajectory*, suatu desain didaktis disusun untuk mengatasi hambatan belajar Sistem Persamaan Linier Dua Variabel. Hasil implementasi desain didaktis tersebut menunjukkan bahwa kendala siswa ketika menentukan konstanta pengali bisa diminimalkan. Siswa bisa menjelaskan dengan bahasanya sendiri alasan dia memilih konstanta pengali. Siswa bisa menunjukkan cara memilih operasi tambah atau kurang ketika ingin mengeliminasi salah satu variabel. Melalui permasalahan yang disajikan dengan gambar terlebih dahulu, siswa bisa memahami cara membuat model matematika dari masalah kontekstual.

Kata kunci: Sistem Persamaan Linier Dua Variabel, Penelitian Desain Didaktis

ABSTRACT

"Didactical Design of Linear Equation Systems in Two Variables for Junior High School Students"

Nilam Manik Malela (2010289). Master Program of Mathematics Education. Faculty of Mathematics and Sciences Education. Indonesia University of Education.

Linear Equation Systems in Two Variables is one of the important topics in mathematics. However, there are learning obstacles when students study this topic. This study aims to overcome student learning obstacles on this topic. This was a qualitative study that used didactical design research based on Brousseau's theory of didactical situation. The results of the learning obstacles analysis show that the types of student obstacles are included in ontogenical obstacle, didactical obstacles, and epistemological obstacle. Ontogenical obstacles occur when students have difficulty calculating integers, making linear graphs, and making mathematical models from contextual problems. Didactical obstacles occur when students make mistakes when choosing a constant multiplier for both equations in the system. Students just perform the steps of the elimination method without understanding its purpose. Epistemological obstacle occurs when students cannot interpret the solution of the Linear Equation Systems in Two Variables. Based on the analysis of learning obstacles and a hypothetical learning trajectory, a didactical design was developed to overcome the learning obstacles of the Linear Equation Systems in Two Variables. The results of the implementation of the didactical design show that students' obstacles when determining the multiplier constant can be minimized. Students can explain why they chose the constant multiplier in their own language. Students can show how to choose the operation of adding or subtracting when they want to eliminate one of the variables. Through the problems presented with pictures first, students can understand how to make mathematical models of contextual problems.

Keywords: *Learning Linear Equation Systems in Two Variables, Didactical Design Research*

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