**ABSTRAK**

Penelitian ini bertujuan untuk mendeskripsikan dan menelaah peningkatan kemampuan pemahaman dan kemampuan representasi matematik dan pengembangan motivasi belajar, antara siswa yang mendapatkan model *problem based learning* berbantuan geogebra dengan siswa yang mendapatkan model *problem based learning* tanpa berbantuan geogebra. Metode penelitian yang digunakan adalah Metode Campuran (*Mixed Method*) tipe penyisipan (*Embedded Design)*. Populasi penelitian ini adalah seluruh siswa kelas XII MIA di SMA Al-Muttaqin Tasikmalaya. Sampel dalam penelitian ini dipilih sebanyak 2 kelas dari kelas XII MIA. Kelas eksperimen mendapatkan model *problem based learning* berbantuan geogebra dan kelas kontrol mendapatkan model *problem based learning* tanpa berbantuan geogebra. Instrumen penelitian meliputi tes pemahaman, representasi, angket motivasi belajar, pedoman observasi dan pedoman wawancara. Hasil penelitian menunjukkan bahwa (1) Peningkatan kemampuan represenstasi matematik siswa yang menggunakan model *problem based learning* berbantuan geogebra lebih baik dari pada menggunakan model *problem based learning* tanpa berbantuan media *software* geogebra (2) Peningkatan kemampuan pemahaman matematik siswa yang menggunakan model *problem based learning* berbantuan geogebra tidak lebih baik atau sama dengan menggunakan model *problem based learning* tanpa berbantuan media *software* geogebra (3) Terdapat hubungan positif antara peningkatan kemampuan representasi dengan peningkatan kemampuan pemahaman matematik siswa, antara peningkatan kemampuan representasi dengan motivasi belajar siswa, serta antara peningkatan kemampuan pemahaman dengan motivasi belajar siswa.

Kata Kunci: *Problem Based Learning*, geogebra, pemahaman matematik, representasi matematik, motivasi belajar

**ABSTRACT**

This study aims to describe and examine the improvement of the ability of understanding and the ability of mathematical representation and the development of learning motivation, between students who get a model of problem-based learning with geogebra assisted with students who get a problem based learning model without geogebra assisted. The research method used is Mixed Method of Embedded Design.The population of this study is all students of class XII MIA in SMA Al-Muttaqin Tasikmalaya. The sample in this study was selected as many as 2 classes of class XII MIA. The experimental class gets the model of problem-based learning with geogebra assisted and the control class gets the problem based learning model without geogebra assisted. The research instruments include understanding ability test, representation, motivation study questionnaire, observation guidance and interview guide. The result of the research shows that (1) the improvement of mathematical representation ability of students using geogebra-based problem-based learning model is better than using problem based learning model without the aid of media of geogebra software (2) Improvement of students' mathematical understanding using problem based learning model assisted by geogebra (3) There is a positive relationship between improving the ability of representation with the improvement of students 'mathematical understanding ability, between improving the ability of representation with students' learning motivation, and between improving the comprehension ability and learning motivationStudents.

Keywords: Problem based learning, geogebra, mathematical understanding, mathematical representation, learning motivation