

**PENINGKATAN KEMAMPUAN REPRESENTASI DAN KONEKSI
MATEMATIS SERTA KEMANDIRIAN BELAJAR MAHASISWA
MELALUI MODEL *PROJECT-BASED LEARNING*
BERBANTUAN GEOGEBRA**

DISERTASI

Diajukan untuk Memenuhi Sebagian dari Syarat Memperoleh Gelar Doktor
Pendidikan Matematika



Oleh

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**PROGRAM STUDI PENDIDIKAN MATEMATIKA
FAKULTAS PENDIDIKAN MATEMATIKA DAN ILMU PENGETAHUAN ALAM
UNIVERSITAS PENDIDIKAN INDONESIA
2021**

Ari Septian, 2021

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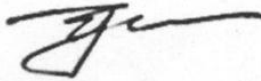
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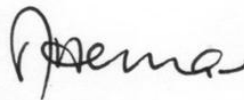
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PENINGKATAN KEMAMPUAN REPRESENTASI DAN KONEKSI MATEMATIS SERTA KEMANDIRIAN BELAJAR MAHASISWA MELALUI MODEL *PROJECT-BASED LEARNING* BERBANTUAN GEOGEBRA

ABSTRAK

Penelitian ini bertujuan untuk mengkaji pencapaian dan peningkatan kemampuan representasi matematis, kemampuan koneksi matematis, dan kemandirian belajar mahasiswa melalui model *project-based learning* berbantuan Geogebra. Metode penelitian yang digunakan adalah *quasi-experimental* dengan desain *pretest- posttest nonequivalent multiple group design*. Populasinya yaitu mahasiswa program studi pendidikan matematika pada salah satu Perguruan Tinggi di Jawa Barat. Kelas 1A dan 1B menjadi sampel dalam penelitian ini. Teknik analisis data menggunakan uji t sampel independen, uji mann whitney, uji anova dua jalur, uji kruskal wallis, deskriptif, dan uji asosiasi kontingensi. Hasil penelitian menunjukkan bahwa: (1) pencapaian dan peningkatan kemampuan representasi matematis mahasiswa yang memperoleh model *project-based learning* berbantuan Geogebra lebih baik daripada mahasiswa yang memperoleh model *project-based learning*; (2) tidak terdapat pengaruh interaksi model pembelajaran dan gaya kognitif terhadap pencapaian kemampuan representasi matematis mahasiswa. namun, terdapat pengaruh interaksi model pembelajaran dan gaya kognitif terhadap peningkatan kemampuan representasi matematis mahasiswa; (3) pencapaian dan peningkatan kemampuan koneksi matematis mahasiswa yang memperoleh model *project-based learning* berbantuan Geogebra lebih baik daripada mahasiswa yang memperoleh model *project-based learning*; (4) tidak terdapat pengaruh interaksi model pembelajaran dan gaya kognitif terhadap pencapaian dan peningkatan kemampuan koneksi matematis mahasiswa; (5) pencapaian kemandirian belajar mahasiswa yang memperoleh model *project-based learning* berbantuan Geogebra lebih baik daripada mahasiswa yang memperoleh model *project-based learning*; (6) tidak terdapat pengaruh interaksi model pembelajaran dan gaya kognitif terhadap pencapaian kemandirian belajar mahasiswa; (7) ketercapaian indikator kemampuan representasi matematis mahasiswa yang memperoleh model *project-based learning* berbantuan Geogebra berkategori baik. Sedangkan mahasiswa yang memperoleh model *project-based learning* berkategori cukup; (8) ketercapaian indikator kemampuan koneksi matematis mahasiswa yang memperoleh model *project-based learning* berbantuan Geogebra berkategori baik. Sedangkan mahasiswa yang memperoleh model *project-based learning* berkategori cukup; (9) ketercapaian indikator kemandirian belajar mahasiswa yang menerapkan model *project-based learning* berbantuan Geogebra maupun mahasiswa yang menerapkan model *project-based learning* berkategori baik; (10) tidak terdapat asosiasi yang signifikan antara kemampuan representasi dan koneksi matematis mahasiswa yang memperoleh model *project-based learning* berbantuan Geogebra; (11) terdapat asosiasi yang signifikan antara kemandirian belajar dengan kemampuan representasi matematis mahasiswa yang memperoleh model *project-based learning* berbantuan Geogebra; dan (12) terdapat asosiasi yang signifikan antara kemandirian belajar dengan kemampuan koneksi matematis mahasiswa yang memperoleh model *project-based learning* berbantuan Geogebra.

Kata kunci: Kemampuan Representasi Matematis, Kemampuan Koneksi Matematis, Kemandirian Belajar, *Project-Based Learning*, Geogebra

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IMPROVEMENT OF MATHEMATICAL REPRESENTATION AND CONNECTION ABILITY AND SELF-REGULATED LEARNING OF STUDENTS THROUGH GEOGEBRA ASSISTED PROJECT-BASED LEARNING MODEL

ABSTRACT

This study aims to examine the achievement and improvement of mathematical representation abilities, mathematical connection abilities, and student self-regulated learning through a project-based learning model assisted by Geogebra. The research method used was a quasi-experimental design with a pretest-posttest nonequivalent multiple group design. The population is students of the Mathematics Education Study Program at University in West Java. Class 1A and 1B were the samples in this study. The data analysis technique used independent sample t test, Mann Whitney test, two-way ANOVA test, Kruskal Wallis test, descriptive, and contingency association test. The results showed that: (1) the achievement and improvement of the mathematical representation abilities of students who obtained the project-based learning model assisted by Geogebra were better than students who obtained the project-based learning model; (2) there is no interaction effect of learning models and cognitive styles on the achievement of students' mathematical representation abilities. however, there is an interaction effect of learning models and cognitive styles on the improvement of students' mathematical representation abilities; (3) the achievement and improvement of students' mathematical connection skills who obtained the Geogebra-assisted project-based learning model was better than students who obtained the project-based learning model; (4) there is no interaction effect of the interaction of learning models and cognitive styles on the achievement and improvement of students' mathematical connection abilities; (5) the achievement of self-regulated learning who received the project-based learning model assisted by Geogebra was better than students who obtained the project-based learning model; (6) there is no interaction effect of learning models and cognitive styles on the achievement of student self-regulated learning; (7) the achievement of the mathematical representation ability indicators of students who obtained the Geogebra-assisted project-based learning model was categorized as good. Meanwhile, students who obtained the project-based learning model were categorized as sufficient; (8) the achievement of the mathematical connection ability indicators of students who obtained the Geogebra-assisted project-based learning model was categorized as good. Meanwhile, students who obtained the project-based learning model were categorized as sufficient; (9) achievement indicators of self-regulated learning who apply the project-based learning model assisted by Geogebra and students who apply the project-based learning model are categorized as good; (10) there is no significant association between representation ability and mathematical connections of students who get a project-based learning model assisted by Geogebra; (11) there is a significant association between self-regulated learning and the mathematical representation ability of students who obtain a project-based learning model assisted by Geogebra; and (12) there is a significant association between self-regulated learning and the mathematical connection ability of students who obtain a project-based learning model assisted by Geogebra.

Keywords: Mathematical Representation Ability, Mathematical Connection Ability, Self-Regulated Learning, Project-Based Learning, Geogebra

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