MODEL *PROJECT-BASED BLENDED LEARNING* DENGAN *COGNITIVE CONFLICT STRATEGY* UNTUK MENINGKATKAN *MATHEMATICAL SPATIAL LITERACY,* KEMAMPUAN *MATHEMATICAL LOGICAL THINKING* dan *MATHEMATICAL SELF-CONCEPT* SISWA SMA

DISERTASI

diajukan untuk memenuhi sebagian syarat untuk memperoleh gelar Doktor
Pendidikan Matematika

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BANDUNG
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ANALISIS PROSES BERPIKIR GEOMETRI MAHASISWA CALON GURU MATEMATIKA DALAM PERSPEKTIF *WAY OF THINKING* DAN *WAY OF UNDERSTANDING* PADA IMPLEMENTASI DESAIN DIDAKTIS INTEGRASI *DYNAMIC GEOMETRY SOFTWARE*

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MODEL *PROJECT-BASED BLENDED LEARNING* DENGAN *COGNITIVE CONFLICT STRATEGY* UNTUK MENINGKATKAN *MATHEMATICAL SPATIAL LITERACY*, KEMAMPUAN *MATHEMATICAL LOGICAL THINKING* dan *MATHEMATICAL SELF-CONCEPT* SISWA SMA
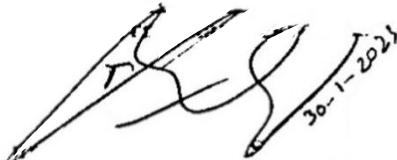
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ABSTRAK

Rika Mulyati Mustika Sari (1907191). Model *Project-Based Blended Learning* **dengan** *Cognitive Conflict Strategy* **untuk Meningkatkan** *Mathematical Spatial Literacy***, Kemampuan** *Mathematical Logical Thinking* **dan** *Mathematical Self-Concept* **Siswa SMA**

Penelitian ini dilatabelakangi karena masih rendanya literasi spasial matematis, kemampuan berpikir logis matematis siswa SMA dalam materi geometri serta penilaian afektif yang masih jarang diberikan kepada siswa salah satunya *Mathematical Self-Concept*. Tujuan utama penelitian ini adalah untuk mengkaji peningkatan literasi spasial matematis, kemampuan berpikir logis matematis, dan pencapaian *Mathematical Self-Concept* siswa, sebagai akibat dari pembelajaran *Project-Based Blended Learning* dengan *Cognitive Conflict Strategy* (PjBBL-CCS) dan pembelajaran *Problem-Based Learning* (PBL). Penelitian ini dilaksanakan atas dasar pentingnya literasi spasial matematis, kemampuan berpikir logis matematis, dan *Mathematical Self-Concept* untuk dimiliki siswa untuk meningkatkan kompetensinya dalam pembelajaran matematika. Penelitian ini menggunakan metode kuasi eksperimen kelompok PjBBL-CCS dengan desain yang digunakan yaitu *desain faktorial*. Penelitian ini merupakan kelompok PjBBL-CCS yang dilakukan pada siswa SMA Negeri di Kabupaten Bandung. Sampel penelitian adalah seluruh siswa kelas XI Tahun Pelajaran 2021/2022. Variabel-variabel penelitian ditentukan berdasarkan model pembelajaran, peringkat sekolah, dan pengetahuan awal matematis (PAM). Penentuan kategori PAM siswa diperoleh melalui tes dan di bagi menjadi tiga kategori, yaitu: tinggi, sedang, dan rendah. Penentuan peringkat sekolah didasarkan kepada perolehan nilai ujian nasional pada pelajaran matematika yang terbagi menjadi tiga peringkat sekolah, yaitu: tinggi, sedang dan rendah. Dalam penelitian ini dipilih sekolah pada peringkat tinggi dan sedang. Pada setiap sekolah yang terpilih, dipilih dua kelas secara acak yakni kelompok PjBBL-CCS dan kelompok PBL. Kelompok PjBBL-CCS diberi perlakuan PjBBL-CCS sedangkan kelompok PBL diberikan pembelajaran PBL. Instrumen yang digunakan dalam penelitian ini terdiri atas tes pengetahuan awal matematis (PAM), tes literasi spasial matematis, tes kemampuan berpikir logis matematis, dan skala *Mathematical Self-Concept*. Data dianalisis dengan menggunakan uji *Mann Whitney U Test* dan *Two Way Anova*. Berdasarkan hasil analisis, diperoleh simpulan secara umum, bahwa: (1) a) Ditinjau dari model pembelajaran, peningkatan literasi spasial matematis siswa yang memperoleh pembelajaran PjBBL-CCS lebih baik daripada siswa yang memperoleh pembelajaran PBL, b) Ditinjau dari PAM peningkatan literasi spasial matematis siswa untuk tiap-tiap PAM berbeda, c) Ditinjau dari peringkat sekolah, peningkatan literasi spasial matematis siswa yang memperoleh pembelajaran PjBBL-CCS sama dengan siswa yang memperoleh pembelajaran PBL; (2) Tidak terdapat pengaruh interaksi antara pembelajaran (PjBBL-CCS dan PBL) dan PAM terhadap peningkatan literasi spasial matematis siswa; (3) Tidak terdapat pengaruh interaksi antara pembelajaran (PjBBL-CCS dan PBL) dan peringkat sekolah (tinggi, sedang) terhadap peningkatan literasi spasial matematis siswa; (4) a) Ditinjau dari model pembelajaran, peningkatan kemampuan berpikir logis matematis siswa yang mendapatkan pembelajaran PjBBL-CCS lebih baik daripada siswa yang mendapatkan pembelajaran PBL, b) Ditinjau dari PAM rataan peningkatan kemampuan berpikir logis matematis siswa untuk tiap-tiap kelompok perlakuan berbeda, c) Ditinjau dari peringkat sekolah, peningkatan kemampuan berpikir logis matematis siswa yang memperoleh pembelajaran PjBBL-CCS sama dengan siswa yang memperoleh pembelajaran PBL; (5) Tidak terdapat pengaruh interaksi antara pembelajaran (PjBBL-CCS dan PBL) dan PAM terhadap peningkatan kemampuan berpikir logis matematis siswa; (6) Tidak terdapat pengaruh interaksi antara pembelajaran (PjBBL-CCS dan PBL) dan peringkat sekolah (tinggi, sedang) terhadap peningkatan kemampuan berpikir logis matematis; (7) a) Ditinjau dari model pembelajaran, pencapaian *Mathematical Self-Concept* siswa yang mendapat pembelajaran PjBBL-CCS sama dengan siswa yang mendapat pembelajaran PBL, b) Ditinjau dari PAM paling sedikit ada satu rataan kelompok perlakuan yang tidak sama dengan rataan kelompok perlakuan lain c) Ditinjau dari peringkat sekolah (tinggi dan sedang), pencapaian *Mathematical Self-Concept* setiap kelompok perlakuan sama; (8) Tidak terdapat pengaruh interaksi antara pembelajaran (PjBBL-CCS dan PBL) dan PAM terhadap pencapaian *Mathematical Self-Concept* siswa; (9) Tidak terdapat pengaruh interaksi antara pembelajaran (PjBBL-CCS dan PBL) dan peringkat sekolah (tinggi, sedang) terhadap pencapaian *Mathematical Self-Concept* siswa.

Kata kunci: *Project-Based Learning*, *Blended Learning*, *Conflict Cognitive Strategy*, Literasi Spasial Matematis, Kemampuan Berpikir Logis Matematis, *Mathematical Self-Concept*.

Rika Mulyati Mustika Sari (1907191). Project-Based Blended Learning With Cognitive Conflict Strategy to Improve Mathematical Spatial Literacy, Logical Thinking Skills, and Self-Concept Students Senior High School.

ABSTRACT

The background of this research is that there is still a lack of mathematical spatial literacy, high school students' ability to think mathematically and logically about geometry material, and affective assessments that are rarely given to students, one of which is Mathematical Self-Concept.The main purpose of this study is to examine the increase in mathematical spatial literacy, mathematical logical thinking skills, and students' mathematical self-concept achievement as a result of Project-Based Blended Learning with Cognitive Conflict Strategy (PjBBL-CCS) and Problem-Based Learning (PBL) learning. This study conducts on the basis of the relevance of mathematical spatial literacy, the skills to think mathematically logically, and mathematical self-concept for students to have in order to enhance their mathematics learning competence. This study employed a quasi-experimental design utilizing a factorial methodology. This study is an experiment undertaken with Bandung regency public high school students. The sample of this study consists of all eleventh-grade students for the academic year 2021-2022. The factors for the study were established based on the learning model, school ranking, and prior mathematical expertise (PAM). The PAM classifications of students are determined by tests and categorized into three categories: high, medium, and low. The rankings of schools are based on the achievement of national exam scores in mathematics, which are categorized into three levels: high, medium, and low. This study chose schools with high and average ratings. In each selected school, two classes, the experimental class and the control class, were picked at random. The experimental class received PjBBL-CCS, while the control class received PBL instruction. A mathematical prior knowledge exam (PAM), a mathematical spatial literacy test, a mathematical logical reasoning skills test, and a mathematical self-concept scale were employed in this study. Using the t-test, two-way ANOVA, and one-way ANOVA, the data were evaluated. The results of data analysis lead to the following conclusions; (1) a) The growth in mathematical spatial literacy of students who get PjBBL-CCS learning is greater than that of students who receive PBL learning, b) based on the learning model. Regarding PAM, the increase in students' mathematical spatial literacy differs for each PAM, c). In terms of school rankings, the increase in the mathematical spatial literacy of students who receive PjBBL-CCS learning is the same as that of students who receive PBL learning; (2) There is no interaction effect between learning (PjBBL-CCS and PBL) and PAM on increasing students' mathematical spatial literacy; (3) There is no interaction effect between learning (PjBBL-CCS and PBL) and school rankings (high, medium) on increasing students' mathematical spatial literacy; (4) a) The improvement in logical-mathematical reasoning skills of students who received PjBBL-CCS learning was greater than that of students who received PBL learning, b). Regarding PAM, the average growth in mathematical and logical reasoning skills for each treatment group, c) In terms of the learning model, students who obtain PjBBL-CCS learning attain the same mathematical self-concept as students who receive PBL learning. (5) There is no interaction effect between learning (PjBBL-CCS and PBL) and PAM on increasing students' mathematical logical thinking skills; (6) there is no effect of interaction between learning (PjBBL-CCS and PBL) and school ranking (high, medium) on the improvement of mathematical logical thinking skills; (7) a) in terms of the learning model, the achievement of the mathematical self-concept of students who receive PjBBL-CCS learning is the same as students who receive PBL learning, b) In terms of PAM, there is at least one treatment group average that is not the same as the other treatment group averages, c) In terms of school rankings (high and medium), the achievement of the mathematical self-concept of each treatment group was the same; (8) There is no interaction effect between learning (PjBBLCCS and PBL) and PAM on students' mathematical self-concept achievement; (9) There is no interaction effect between learning (PjBBL-CCS and PBL) and school rankings (high, medium) on students' mathematical self-concept achievement.

Keywords: Project-based Learning, Blended Learning, Conflict Cognitive Strategy, Mathematical Spatial Literacy, Mathematical Logical Thinking Skills, Mathematical Self-Concept.

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