

ABSTRAK

TIRAYANI HASIBUAN: Pengaruh Model *Problem Based Learning* Berbantuan Aplikasi *Matrix Calculator* Terhadap Kemampuan Berpikir Kritis Matematis Siswa. **Program Studi Pendidikan Matematika FKIP Universitas Malikussaleh, 2026.**

Kemampuan berpikir kritis matematis merupakan salah satu kemampuan utama yang harus dikuasai siswa dalam pembelajaran matematika. Akan tetapi, kemampuan tersebut masih berada pada tingkat yang rendah, terutama dalam memahami materi Sistem Persamaan Linear Tiga Variabel (SPLTV). Salah satu alternatif yang dapat diterapkan untuk mengatasi permasalahan tersebut adalah melalui penggunaan model *Problem Based Learning* (PBL) dengan bantuan aplikasi *Matrix Calculator*. Penelitian ini bertujuan untuk menganalisis pengaruh penerapan model *Problem Based Learning* berbantuan aplikasi *Matrix Calculator* terhadap kemampuan berpikir kritis matematis siswa pada materi SPLTV. Penelitian ini menggunakan pendekatan kuantitatif dengan metode *quasi-experimental*. Populasi penelitian adalah seluruh siswa kelas X SMA Negeri 1 Muara Batu. Sampel penelitian terdiri atas kelas X-3 sebagai kelas eksperimen dan kelas X-4 sebagai kelas kontrol, masing-masing berjumlah 19 siswa. Data dikumpulkan melalui tes uraian kemampuan berpikir kritis matematis yang telah melalui uji validitas, reliabilitas, daya pembeda, dan tingkat kesukaran. Data dianalisis menggunakan uji normalitas, uji homogenitas, dan uji *Mann-Whitney U-Test*. Hasil penelitian menunjukkan bahwa hasil uji *Mann-Whitney U-Test* memperoleh nilai signifikansi sebesar $0,000 < 0,05$, sehingga H_0 ditolak dan H_1 diterima. Selain itu, nilai rata-rata *posttest* pada kelas eksperimen lebih tinggi dibandingkan dengan kelas kontrol. Temuan tersebut menunjukkan bahwa penerapan model *Problem Based Learning* berbantuan aplikasi *Matrix Calculator* memberikan pengaruh yang signifikan terhadap kemampuan berpikir kritis matematis siswa. Melalui model pembelajaran ini, siswa didorong untuk memahami dan mengidentifikasi permasalahan, menganalisis informasi yang tersedia, mengevaluasi strategi penyelesaian, serta membuat kesimpulan berdasarkan alasan yang logis, sehingga proses pembelajaran menjadi lebih aktif dan mendukung perkembangan kemampuan berpikir kritis matematis siswa.

Kata kunci: *Problem Based Learning*, *Matrix Calculator*, berpikir kritis matematis, SPLTV.

ABSTRACT

TIRAYANI HASIBUAN: *The Effect of the Problem Based Learning Model Assisted by the Matrix Calculator Application on Students' Mathematical Critical Thinking Skills. Undergraduate Thesis, Mathematics Education Study Program, Faculty of Teacher Training and Education, Malikussaleh University, 2026.*

Mathematical critical thinking skills are among the essential competencies that students should possess in mathematics learning. However, these skills remain relatively low, particularly in the topic of Systems of Linear Equations in Three Variables (SPLTV). One approach to address this issue is the implementation of the Problem Based Learning (PBL) model assisted by the Matrix Calculator application. This study aimed to determine the effect of implementing the Problem Based Learning model assisted by the Matrix Calculator application on students' mathematical critical thinking skills in learning SPLTV. This study employed a quantitative approach using a quasi-experimental method. The population consisted of all tenth-grade students at SMA Negeri 1 Muara Batu. The sample comprised Class X-3 as the experimental group and Class X-4 as the control group, with 19 students in each class. Data were collected through essay tests designed to measure students' mathematical critical thinking skills. The instrument had met the requirements of validity, reliability, discrimination index, and difficulty level. The collected data were analyzed using the Shapiro–Wilk normality test, Levene's homogeneity test, and the Mann–Whitney U test. The results revealed that the Mann–Whitney U test produced a significance value of 0.000 (< 0.05), indicating that H_0 was rejected and H_1 was accepted. Moreover, the mean posttest score of the experimental group was higher than that of the control group. These findings demonstrate that the implementation of the Problem Based Learning model assisted by the Matrix Calculator application had a significant effect on students' mathematical critical thinking skills. This learning model encourages students to identify problems, analyze information, evaluate solution strategies, and draw logical conclusions, thereby making the learning process more active and supporting the development of students' critical thinking skills.

Keywords: Problem Based Learning, Matrix Calculator, mathematical critical thinking skills, SPLTV.