ABSTRAK

KHALIDATUL HANUM: Peningkatan kemampuan berpikir kritis matematis dan Keaktifan Belajar siswa melalui pendekatan *Science, Technology, Engineering, Mathematics* (STEM) di SMPN 1 Muara Batu. **Program Studi Pendidikan Matematika FKIP Universitas Malikussaleh, 2026.**

Rendahnya kemampuan berpikir kritis matematis siswa disebabkan oleh kesulitan siswa dalam memahami permasalahan, menganalisis informasi, mengevaluasi proses penyelesaian, dan menarik kesimpulan secara tepat. Selain itu, keaktifan belajar siswa juga masih perlu ditingkatkan yang ditunjukkan oleh kurangnya partisipasi siswa dalam bertanya, mengemukakan pendapat, bekerja sama dalam kelompok, dan mempresentasikan hasil diskusi. Salah satu alternatif yang dapat diterapkan untuk mengatasi permasalahan tersebut adalah pendekatan *Science, Technology, Engineering, and Mathematics* (STEM). Penelitian ini bertujuan Untuk mengetahui peningkatan kemampuan berpikir kritis matematis dan keaktifan belajar siswa yang memperoleh pembelajaran dengan pendekatan STEM lebih dari pada siswa yang memperoleh pembelajaran konvensional. Penelitian ini merupakan penelitian kuantitatif dengan jenis penelitian *quasi experiment* dan menggunakan desain *nonequivalent control group design*. Populasi penelitian adalah seluruh siswa kelas VIII SMPN 1 Muara Batu. Sampel dipilih menggunakan teknik *purposive sampling*, yaitu kelas VIII 3 sebagai kelas eksperimen dan kelas VIII 2 sebagai kelas control. Instrumen penelitian yang digunakan berupa tes kemampuan berpikir kritis matematis, angket keaktifan belajar siswa, serta lembar observasi aktivitas guru dan siswa. Pengujian hipotesis dilakukan menggunakan *Independent Sample t-test* dan uji *Mann–Whitney* berbantuan *software SPSS* pada taraf signifikansi 0,05. Hasil penelitian menunjukkan bahwa peningkatan kemampuan berpikir kritis matematis siswa yang memperoleh pembelajaran dengan pendekatan STEM lebih baik dibandingkan dengan siswa yang memperoleh pembelajaran konvensional, dengan nilai signifikansi sebesar 0,000. Sementara itu, peningkatan keaktifan belajar siswa yang memperoleh pembelajaran dengan pendekatan STEM tidak lebih baik dibandingkan dengan siswa yang memperoleh pembelajaran konvensional, dengan nilai signifikansi sebesar 0,144. Dengan demikian, dapat disimpulkan bahwa pendekatan *Science, Technology, Engineering, and Mathematics* (STEM) mampu menghasilkan peningkatan kemampuan berpikir kritis matematis yang lebih baik daripada pembelajaran konvensional, tetapi belum mampu menghasilkan peningkatan keaktifan belajar siswa yang lebih baik pada materi relasi dan fungsi di SMPN 1 Muara Batu.

Kata Kunci: Kemampuan berpikir kritis matematis, keaktifan belajar siswa, *Science, Technology, Engineering, and Mathematics* (STEM)

ABSTRACT

KHALIDATUL HANUM**: Improving Students' Mathematical Critical Thinking Skills and Learning Activeness through the Science, Technology, Engineering, and Mathematics (STEM) Approach at SMPN 1 Muara Batu.* ***Mathematics Education Study Program, Faculty of Teacher Training and Education, Universitas Malikussaleh, 2026.

The low level of students' mathematical critical thinking skills is caused by students' difficulties in understanding problems, analyzing information, evaluating solution processes, and drawing appropriate conclusions. In addition, students' learning activeness also needs to be improved, as indicated by their lack of participation in asking questions, expressing opinions, working collaboratively in groups, and presenting discussion results. One alternative that can be implemented to address these problems is the Science, Technology, Engineering, and Mathematics (STEM) approach. This study aimed to determine whether the improvement in mathematical critical thinking skills and learning activeness of students who received instruction through the STEM approach was greater than that of students who received conventional instruction. This study employed a quantitative approach using a quasi-experimental method with a nonequivalent control group design. The population consisted of all eighth-grade students at SMPN 1 Muara Batu. The sample was selected using purposive sampling, with Class VIII 3 as the experimental class and Class VIII 2 as the control class. The research instruments consisted of a mathematical critical thinking skills test, a student learning activeness questionnaire, and teacher and student activity observation sheets. Hypothesis testing was conducted using the Independent Samples t-test and the Mann–Whitney U test with the assistance of SPSS software at a significance level of 0.05. The results showed that the improvement in students' mathematical critical thinking skills who received instruction through the STEM approach was greater than that of students who received conventional instruction, with a significance value of 0.000. Meanwhile, the improvement in learning activeness of students who received instruction through the STEM approach was not greater than that of students who received conventional instruction, with a significance value of 0.144. Therefore, it can be concluded that the Science, Technology, Engineering, and Mathematics (STEM) approach resulted in a greater improvement in students' mathematical critical thinking skills than conventional instruction, but it did not result in a greater improvement in students' learning activeness in the topic of relations and functions at SMPN 1 Muara Batu.

***Keywords**: Mathematical critical thinking skills, students' learning activeness, Science, Technology, Engineering, and Mathematics (STEM)*