

ABSTRAK

Rizkiyan Hadi. Pengembangan Perangkat Pembelajaran Matematika Berbasis *Problem Based Learning* terintegrasi *STEM* untuk Meningkatkan Kemampuan Berpikir Kritis dan Kemampuan Komunikasi Matematis Siswa MTs Riyadhussholihin. Tesis. Medan: Program Studi Pendidikan Matematika Pascasarjana Universitas Negeri Medan, 2025.

Penelitian ini bertujuan untuk menghasilkan perangkat pembelajaran matematika yakni berupa Rencana Pelaksanaan Pembelajaran (RPP) dan Lembar kerja Peserta didik (LKPD) berbasis *problem based learning* (PBL) terintegrasi *STEM* yang teruji kevalidan, kepraktisan dan keefektifan sehingga dapat digunakan dalam pembelajaran. Penelitian ini merupakan penelitian pengembangan. Model pengembangan yang digunakan dalam penelitian ini adalah model *ADDIE* dengan subjek penelitian 32 orang siswa/i kelas VII-1 dan 32 orang siswa/i kelas VII-3 di MTs Riyadhussholihin. Objek dalam penelitian ini adalah perangkat pembelajaran matematika berbasis *Problem Based Learning terintegrasi STEM* pada materi bangun datar. Kevalidan perangkat pembelajaran matematika yang dikembangkan ditinjau dari analisis hasil validitas perangkat pembelajaran matematika oleh para validator dengan rata-rata validitas RPP sebesar 4,58, dan rata-rata validitas lembar kerja peserta didik (LKPD) sebesar 4,40 (kategori “valid”). Sementara itu, kepraktisan perangkat pembelajaran matematika dilihat dari skor observasi keterlaksanaan pembelajaran pada uji coba II yaitu sebesar 3,40 (kategori “terlaksana dengan baik”). Keefektifan perangkat pembelajaran matematika ditinjau dari aspek ketuntasan klasikal dan respon siswa. 1) Ketuntasan klasikal mencapai 90,63 %, telah memenuhi kriteria ketuntasan. 2) Respon siswa terhadap pembelajaran diperoleh sangat positif dengan perolehan 97,44%. Berdasarkan indeks gain ternormalisasi, diperoleh bahwa pada uji coba II terjadi peningkatan kemampuan berpikir kritis dan kemampuan komunikasi matematis siswa sebesar 0,59 (kriteria “sedang”).

Kata Kunci: Perangkat Pembelajaran Matematika, *Problem Based Learning* terintegrasi *STEM*, Kemampuan Berpikir Kritis, Kemampuan Komunikasi Matematis siswa.



ABSTRAC

Rizkiyan Hadi. Development of Mathematics Learning Tools Based on Problem Based Learning Integrated with STEM to Improve Critical Thinking Skills and Mathematical Communication Skills of MTs Riyadhussholihin Students. Thesis. Medan: Postgraduate Mathematics Education Study Program, State University of Medan, 2025.

This study aims to produce mathematics learning tools in the form of Lesson Implementation Plans (RPP) and Student Worksheets (LKPD) based on STEM-integrated problem-based learning (PBL) that have been tested for validity, practicality, and effectiveness so that they can be used in learning. This research is a development research. The development model used in this study is the ADDIE model with research subjects of 32 students of class VII-1 and 32 students of class VII-3 at MTs Riyadhussholihin. The object of this study is a mathematics learning tool based on STEM-integrated Problem Based Learning on the material of flat shapes. The validity of the developed mathematics learning tools is reviewed from the analysis of the validity results of the mathematics learning tools by the validators with an average validity of the RPP of 4.58, and an average validity of the student worksheets (LKPD) of 4.40 (category "valid"). Meanwhile, the practicality of the mathematics learning tools is seen from the observation score of the implementation of learning in trial II, which is 3.40 (category "well implemented"). The effectiveness of the mathematics learning tools was assessed in terms of classical mastery and student responses. 1) Classical mastery reached 90.63%, meeting the completeness criteria. 2) Student responses to the learning were very positive, with a score of 97.44%. Based on the normalized gain index, the second trial showed an increase in students' critical thinking and mathematical communication skills of 0.59 (a "moderate" criterion).

Keywords: Mathematics Learning Tools, STEM-integrated Problem-Based Learning, Critical Thinking Skills, Students' Mathematical Communication Skills.

