

ABSTRAK

Rahel Elsa Dwi Putri. 2026. Pengembangan Lembar Kerja Peserta Didik Berbasis Pendidikan Matematika Realistik Indonesia Berbantuan GeoGebra untuk Menumbuhkan *Creative Mathematical Reasoning*. Skripsi, Program Studi Pendidikan Matematika, FKIP, Universitas PGRI Madiun. Pembimbing (I) Titin Masfingatin, M.Pd. (II) Indra Puji Astuti, M.Pd.

Penelitian ini dilatarbelakangi oleh rendahnya kemampuan *Creative Mathematical Reasoning* (CMR) siswa pada materi trigonometri serta belum optimalnya penggunaan bahan ajar yang mampu memfasilitasi pembelajaran kontekstual dan eksploratif. Penelitian ini bertujuan untuk mengembangkan Lembar Kerja Peserta Didik (LKPD) berbasis Pendidikan Matematika Realistik Indonesia (PMRI) berbantuan GeoGebra yang valid, praktis, dan efektif dalam menumbuhkan CMR. Penelitian ini merupakan penelitian dan pengembangan (*Research and Development*) dengan menggunakan model Tessmer yang meliputi tahap *preliminary*, *self-evaluation*, *expert review*, *one-to-one evaluation*, *small group evaluation*, dan *field test*. Subjek uji lapangan adalah 28 siswa kelas X TPM 2 SMKN 2 Jiwan yang dipilih menggunakan teknik *purposive sampling*. Teknik pengumpulan data menggunakan lembar validasi, angket respon guru, angket respon siswa, serta *pre-test* dan *post-test*. Data dianalisis menggunakan indeks *Aiken's V*, koefisien reliabilitas, analisis persentase, dan uji N-Gain. Hasil penelitian menunjukkan bahwa LKPD memperoleh nilai validitas sebesar 0,93 dengan kriteria sangat valid dan nilai reliabilitas sebesar 0,90 dengan kriteria reliabel. Kepraktisan LKPD memperoleh persentase sebesar 88,80% dengan kriteria sangat praktis. Keefektifan LKPD ditunjukkan oleh nilai N-Gain sebesar 0,57 dengan kategori sedang serta capaian indikator CMR yang meliputi *novelty* sebesar 85,71%, *plausibility* sebesar 95,98%, dan *mathematical foundation* sebesar 91,96%. Dengan demikian, LKPD berbasis PMRI berbantuan GeoGebra yang dikembangkan memenuhi kriteria valid, praktis, dan efektif sehingga layak digunakan dalam pembelajaran trigonometri di SMK.

Kata Kunci: *Creative Mathematical Reasoning*, GeoGebra, LKPD, Pendidikan Matematika Realistik Indonesia (PMRI), trigonometri.

ABSTRACT

Rahel Elsa Dwi Putri.2026. Development of an Indonesian Realistic Mathematics Education-Based Student Worksheet Assisted by GeoGebra to Foster Creative Mathematical Reasoning. Undergraduate Thesis, Mathematics Education Study Program, Faculty of Teacher Training and Education, Universitas PGRI Madiun. Advisors: (I) Titin Masfingatin, M.Pd. (II) Indra Puji Astuti, M.Pd.

This study was motivated by students' low level of Creative Mathematical Reasoning (CMR) in learning trigonometry and the limited use of instructional materials that facilitate contextual and exploratory learning. The purpose of this study was to develop a GeoGebra-assisted Student Worksheet (SW) based on Indonesian Realistic Mathematics Education (PMRI) that is valid, practical, and effective in fostering students' CMR. This study employed the Research and Development (R&D) method using Tessmer's development model, which consists of the preliminary, self-evaluation, expert review, one-to-one evaluation, small group evaluation, and field test stages. The field test involved 28 students of Class X TPM 2 at SMKN 2 Jiwana selected through purposive sampling. Data were collected using validation sheets, teacher response questionnaires, student response questionnaires, and pre-tests and post-tests. The collected data were analyzed using Aiken's V index, reliability coefficient, percentage analysis, and the N-Gain test. The results showed that the developed Student Worksheet achieved a validity score of 0.93, indicating a very valid category, and a reliability coefficient of 0.90, indicating that it was reliable. The practicality of the Student Worksheet reached 88.80%, which falls into the very practical category. Its effectiveness was demonstrated by an N-Gain score of 0.57, categorized as moderate, as well as improvements in the CMR indicators, namely novelty (85.71%), plausibility (95.98%), and mathematical foundation (91.96%). Therefore, the developed GeoGebra-assisted PMRI-based Student Worksheet met the criteria of being valid, practical, and effective, making it suitable for use in trigonometry learning at vocational high schools.

Keywords: Creative Mathematical Reasoning, GeoGebra, Student Worksheet, Indonesian Realistic Mathematics Education (PMRI), trigonometry