

ABSTRAK

Riska Handayani. Efektivitas Penggunaan E-LKPD Berbasis STEM terhadap Kemampuan Pemahaman Konsep Matematis Siswa SMP pada Materi Bangun Ruang Sisi Datar.

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Kemampuan pemahaman konsep matematis siswa masih tergolong rendah sehingga diperlukan bahan ajar yang mampu meningkatkan keterlibatan siswa dalam proses pembelajaran. Salah satu alternatif yang dapat digunakan adalah E-LKPD berbasis *Science, Technology, Engineering, dan Mathematics* (STEM). Penelitian ini bertujuan untuk mengetahui efektivitas penggunaan E-LKPD berbasis STEM terhadap kemampuan pemahaman konsep matematis siswa SMP pada materi bangun ruang sisi datar.

Penelitian ini menggunakan pendekatan kuantitatif dengan jenis *quasi experiment* dan desain *The Nonequivalent Posttest-Only Control Group Design*. Sampel penelitian terdiri atas kelas eksperimen dan kelas kontrol yang masing-masing berjumlah 21 siswa dan dipilih menggunakan teknik *purposive sampling*. Instrumen penelitian meliputi tes kemampuan pemahaman konsep matematis, lembar observasi kemampuan guru dalam mengelola kegiatan pembelajaran, lembar observasi aktivitas siswa, dan angket respon siswa. Analisis data dilakukan menggunakan uji normalitas *Shapiro-Wilk* dan uji *Mann-Whitney*.

Hasil penelitian menunjukkan bahwa kemampuan guru dalam mengelola pembelajaran berada pada kategori sangat baik dengan persentase 93,48% dan 96,53%, aktivitas siswa berada pada kategori sangat tinggi dengan persentase 90,38% dan 92,05%, serta respon siswa berada pada kategori sangat baik dengan persentase 87,74%. Hasil belajar siswa pada kelas eksperimen memperoleh rata-rata skor posttest sebesar 5,14 dari skor maksimum 6 dengan persentase pencapaian 85,71% dan ketuntasan belajar klasikal sebesar 76,19%. Hasil uji *Mann-Whitney* menunjukkan nilai *Asymp. Sig. (2-tailed)* sebesar $0,002 < 0,05$, sehingga H_0 ditolak dan H_a diterima. Dengan demikian, penggunaan E-LKPD berbasis STEM efektif terhadap kemampuan pemahaman konsep matematis siswa pada materi bangun ruang sisi datar.

Kata Kunci: E-LKPD berbasis STEM, kemampuan pemahaman konsep matematis, bangun ruang sisi datar, Liveworksheets

ABSTRACT

Riska Handayani. *The Effectiveness of STEM-Based E-LKPD on Junior High School Students' Mathematical Conceptual Understanding Ability in Flat-Sided Solid Geometry. Mathematics Education Study Program, Faculty of Teacher Training and Education, Malikussaleh University, 2026.*

Students' mathematical conceptual understanding is still relatively low; therefore, instructional materials that can enhance student engagement in the learning process are needed. One alternative is a STEM-based Electronic Student Worksheet (E-LKPD) that integrates the principles of Science, Technology, Engineering, and Mathematics (STEM). This study aimed to determine the effectiveness of using a STEM-based E-LKPD on junior high school students' mathematical conceptual understanding of solid geometry with flat surfaces.

This study employed a quantitative approach using a quasi-experimental method with a Nonequivalent Posttest-Only Control Group Design. The sample consisted of an experimental class and a control class, each comprising 21 students selected through purposive sampling. The research instruments included a mathematical conceptual understanding test, an observation sheet for teachers' classroom management skills, a student activity observation sheet, and a student response questionnaire. Data were analyzed using the Shapiro–Wilk normality test and the Mann–Whitney U test.

The results showed that the teacher's classroom management skills were in the very good category, with percentages of 93.48% and 96.53%, while student learning activities were in the very high category, with percentages of 90.38% and 92.05%. Student responses were in the very good category, with a percentage of 87.74%. The experimental class achieved an average posttest score of 5.14 out of a maximum score of 6, with a learning achievement percentage of 85.71% and a classical learning mastery percentage of 76.19%. The Mann–Whitney U test yielded an Asymp. Sig. (2-tailed) value of $0.002 < 0.05$, indicating that H_0 was rejected and H_a was accepted. Therefore, the use of a STEM-based E-LKPD was found to be effective in improving junior high school students' mathematical conceptual understanding of solid geometry with flat surfaces.

Keywords: *STEM-based E-LKPD, mathematical conceptual understanding, flat-sided solid geometry.*