

ABSTRAK

MARWAH AFIFAH TANJUNG. Pengaruh LKPD Berbasis *PhET Interactive Simulations* terhadap Hasil Belajar Materi Perbandingan Pecahan Siswa Kelas IV SDN 107400 Bandar Khalipah. Skripsi. Medan: Fakultas Ilmu Pendidikan Universitas Negeri Medan 2026.

Penelitian ini bertujuan untuk menguji pengaruh penggunaan LKPD berbasis *PhET Interactive Simulations* terhadap hasil belajar matematika materi perbandingan pecahan siswa kelas IV SDN 107400 Bandar Khalipah. Hal ini disebabkan karena rendahnya hasil belajar serta kurangnya pemanfaatan media interaktif yang menyebabkan siswa kesulitan memahami konsep pecahan yang abstrak. Metode penelitian yang digunakan adalah kuantitatif melalui eksperimen semu (*quasi-experimental*) dengan desain *Nonequivalent Control Group*. Populasi dalam penelitian adalah seluruh siswa kelas IV SDN 107400 Bandar Khalipah yang berjumlah 39 siswa. Sampel penelitian dipilih secara *purposive sampling*, yang terdiri dari kelas IV B (kelompok eksperimen) dan kelas IV A (kelompok kontrol). Kelompok eksperimen menggunakan LKPD berbasis PhET, sedangkan kelompok kontrol menggunakan pembelajaran langsung dengan media ilustrasi buku cetak. Data dikumpulkan melalui *pre-test* dan *post-test* pilihan ganda, yang kemudian dianalisis menggunakan uji *Independent Sample T-Test* setelah memenuhi uji prasyarat normalitas dan homogenitas. Hasil penelitian menunjukkan pengaruh signifikan penggunaan LKPD berbasis *PhET* terhadap hasil belajar siswa. Hal ini dibuktikan dengan nilai Sig. (2-tailed) sebesar $0,01 < 0,05$ sehingga H_0 ditolak dan H_a diterima. Dengan demikian, penggunaan LKPD berbasis *PhET Interactive Simulations* berpengaruh signifikan dalam meningkatkan hasil belajar matematika siswa pada materi perbandingan pecahan.

Kata kunci: LKPD berbasis *PhET*, hasil belajar matematika, perbandingan pecahan.

ABSTRACT

MARWAH AFIFAH TANJUNG. The Effect of PhET Interactive Simulations-Based Worksheets (LKPD) on Students' Learning Outcomes in Fraction Comparison Material for Fourth Grade Students at SDN 107400 Bandar Khalipah. Skripsi. Medan: Faculty of Education, State University of Medan, 2026.

This research aims to examine the effect of using PhET Interactive Simulations-based Student Worksheets (LKPD) on the mathematics learning outcomes regarding fraction comparison among fourth-grade students at SDN 107400 Bandar Khalipah. The study was driven by low student learning outcomes and a lack of interactive media utilization, which caused students to struggle with understanding abstract fraction concepts. The research methodology employed was quantitative through a quasi-experimental approach with a Nonequivalent Control Group design. The population consisted of all 39 fourth-grade students at SDN 107400 Bandar Khalipah. Samples were selected using purposive sampling, consisting of Class IV-B (experimental group) and Class IV-A (control group). The experimental group utilized PhET-based worksheets, while the control group received direct instruction using printed textbook illustrations. Data were collected through multiple-choice pre-tests and post-tests, which were subsequently analyzed using the Independent Sample T-Test after passing normality and homogeneity prerequisite tests. The results of the study indicate a significant influence of PhET-based worksheets on student learning outcomes. This is evidenced by a Sig. (2-tailed) value of $0,01 < 0,05$ resulting in the rejection of H_0 and the acceptance of H_a . Consequently, it can be concluded that the use of PhET Interactive Simulations-based worksheets significantly improves student mathematics learning outcomes in fraction comparison material.

Keywords: PhET based LKPD, mathematics learning outcomes, fraction comparison.