

M. Faishal. 2024. *Penerapan Laboratorium Virtual OLabs dalam Model Problem based learning terhadap Pemahaman Konsep dan Berpikir Kritis Siswa*. Skripsi, Program Studi Pendidikan IPA, Fakultas Ilmu Pendidikan, Universitas Trunojoyo Madura. Pembimbing: Rahmad Fajar Sidik.

ABSTRAK

Penelitian ini bertujuan untuk mengetahui perbedaan pemahaman konsep dan berpikir kritis siswa kelas yang menerapkan laboratorium *virtual OLabs* dalam model *problem based learning* (PBL) dengan kelas pembelajaran konvensional di MTs Al-Huda Desa Ngrejeng Kecamatan Purwosari Kabupaten Bojonegoro pada materi cahaya dan alat optik. Penelitian ini berjenis kuantitatif dengan metode *quasi experimental design* dengan model *non equivalent control group design*. Populasi pada penelitian ini adalah siswa-siswi kelas VIII A dan VIII B berjumlah total 40 siswa. Sampel menerapkan sampel jenuh, kelas VIII B sebagai kelas eksperimen, dan kelas VIII A sebagai kelas kontrol. Teknik analisis data menerapkan uji *mann whitney u*. Berdasarkan hasil penelitian disimpulkan bahwa, (1) pemahaman konsep siswa kelas eksperimen berbeda dengan kelas kontrol dengan nilai *Sig.* sebesar 0,005 (2) pemahaman konsep siswa meningkat tinggi setelah menerapkan laboratorium *virtual OLabs* dalam PBL, (3) berpikir kritis siswa kelas eksperimen berbeda dengan kelas kontrol, dengan nilai *Sig.* sebesar 0,003, (4) berpikir kritis siswa meningkat sedang setelah menerapkan laboratorium *virtual OLabs* dalam model PBL, (5) penerapan laboratorium *virtual OLabs* dalam model PBL dilakukan dengan sangat baik pada empat pertemuan dengan rata-rata keterlaksanaan 88%, (6) respons siswa terhadap pembelajaran menerapkan laboratorium *virtual OLabs* dalam model PBL baik sekali dengan persentase 76,36%. Penerapan laboratorium *virtual OLabs* dalam model PBL meningkatkan pemahaman konsep dan berpikir kritis siswa kelas eksperimen sehingga terdapat perbedaan dengan kelas kontrol.

Kata kunci: berpikir kritis, cahaya dan alat optik, laboratorium *virtual OLabs*, pemahaman konsep, *problem based learning*.

M. Faishal. 2024. Application of the OLabs *Virtual* Laboratory in the *Problem based learning* Model for Students' Understanding of Concepts and Critical Thinking. Thesis, Science Education Study Program, Faculty of Education, University of Trunojoyo Madura. Supervisor: Rahmad Fajar Sidik.

ABSTRACT

This research aimed to identify differences in concept comprehension and critical thinking between students using the OLabs virtual laboratory in the problem-based learning (PBL) model and those in conventional classes at MTs Al-Huda, Ngrejeng Village, Purwosari Subdistrict, Bojonegoro Regency, on the topic of light and optical instruments. The study was quantitative, employing a quasi-experimental design with a non-equivalent control group model. The population included 40 students from classes VIII A and VIII B. Saturated sampling was used, designating class VIII B as the experimental group and class VIII A as the control group. Data analysis was conducted using the Mann-Whitney U test. Results indicated that: (1) students in the experimental class had significantly different concept comprehension compared to the control class, (2) concept comprehension significantly improved after using the OLabs virtual laboratory in PBL; (3) critical thinking skills in the experimental class differed significantly from the control class, (4) critical thinking moderately improved with the OLabs virtual laboratory in the PBL model; (5) implementation of the OLabs virtual laboratory in PBL was highly effective over four meetings, (6) student responses to learning with the OLabs virtual laboratory in the PBL model were very positive. The application of the OLabs virtual laboratory in the PBL model increases conceptual understanding and critical thinking of experimental class students so that there are differences with the control class.

Keywords: critical thinking, light and optical devices, OLabs virtual laboratory, problem based learning, understanding concepts.