

ABSTRAK

Dinar Ade Nugroho: Penerapan Model *Problem Based Learning* Berbantu *Phyhpox* Untuk Meningkatkan Keterampilan Berpikir Kritis Peserta Didik Pada Materi Gelombang Bunyi

Penelitian ini bertujuan untuk menganalisis peningkatan keterampilan berpikir kritis peserta didik melalui penerapan model *problem based learning* berbantu aplikasi *phyhpox* pada materi gelombang bunyi kelas XI SMA. Metode penelitian yang digunakan adalah kuasi eksperimen dengan *desain nonequivalent control group design*. Subjek penelitian terdiri dari dua kelas, yaitu kelas eksperimen yang mendapatkan pembelajaran dengan model PBL berbantu *phyhpox* dan kelas kontrol yang mendapatkan pembelajaran konvensional. Teknik pengambilan sampel yang digunakan ialah *cluster random sampling*, dengan sampel kelas eksperimen berjumlah 33 peserta didik di kelas XI 4 dan kelas kontrol berjumlah 31 peserta didik di kelas XI 3. Instrumen penelitian berupa Data dikumpulkan melalui instrumen penelitian berupa lembar observasi (LO) dan tes keterampilan berpikir kritis dalam bentuk 12 soal esai yang disusun berdasarkan indikator berpikir kritis menurut Ennis (1998). Hasil penelitian menunjukkan bahwa terdapat perbedaan peningkatan keterampilan berpikir kritis antara kelas eksperimen dan kelas kontrol. Rata-rata nilai pretest kelas eksperimen sebesar 25,13 meningkat menjadi 78,98 pada posttest, dengan *N-Gain* 0,72 (kategori tinggi). Pada kelas kontrol, rata-rata nilai pretest sebesar 22 meningkat menjadi 68 pada posttest, dengan *N-Gain* 0,60 (kategori sedang). Peningkatan tertinggi terjadi pada submateri cepat rambat gelombang dengan *N-Gain* 0,74 (kategori tinggi), sedangkan capaian terendah terdapat pada submateri efek Doppler dengan *N-Gain* 0,69 (kategori sedang). Temuan ini mengindikasikan bahwa penggunaan model PBL berbantu aplikasi *Phyhpox* mampu meningkatkan keterampilan berpikir kritis peserta didik lebih optimal dibandingkan dengan pembelajaran konvensional.

Kata kunci: *Problem Based Learning*, *Phyhpox*, Keterampilan Berpikir Kritis, Gelombang Bunyi.

ABSTRACT

Dinar Ade Nugroho: *The Implementation of Problem-Based Learning Model Assisted by Phyhpox to Improve Students' Critical Thinking Skills on Sound Wave Material*

This study aims to analyze the improvement of students' critical thinking skills through the implementation of the problem based learning model assisted by the hyhpox application in sound wave material for grade XI high school students. The research method employed was quasi-experimental with a nonequivalent control group design. The research subjects consisted of two classes: the experimental class, which received learning through PBL assisted by Phyhpox, and the control class, which received conventional learning. The sampling technique used was cluster random sampling, with the experimental class consisting of 33 students in class XI 1 and the control class consisting of 31 students in class XI 2. The research instruments included observation sheets and a critical thinking skills test in the form of 12 essay questions, which were developed based on Ennis' (1998) critical thinking indicators. The results showed a significant difference in the improvement of critical thinking skills between the experimental and control classes. The average pretest score of the experimental class was 25.13, which increased to 78.98 in the posttest, with an N-Gain of 0.72 (high category). Meanwhile, the control class had an average pretest score of 22, which increased to 68 in the posttest, with an N-Gain of 0.60 (medium category). The highest improvement occurred in the subtopic of wave propagation speed with an N-Gain of 0.74 (high category), while the lowest achievement was in the Doppler effect subtopic with an N-Gain of 0.69 (medium category). These findings indicate that the use of the PBL model assisted by the Phyhpox application can more effectively enhance students' critical thinking skills compared to conventional learning.

Keywords: *Problem-Based Learning, Phyhpox, Critical Thinking Skills, Sound Waves.*