

ABSTRAK

EFEKTIVITAS MODEL *PROBLEM BASED LEARNING* (PBL) BERBANTU *PHET SIMULATION* TERHADAP LITERASI SAINS PESERTA DIDIK PADA MATERI PERUBAHAN IKLIM

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Penelitian ini bertujuan untuk mengkaji efektivitas model *Problem Based Learning* (PBL) berbantuan *PhET Simulation* terhadap literasi sains peserta didik pada materi perubahan iklim. Literasi sains yang dikaji mencakup tiga indikator utama, yaitu menjelaskan fenomena secara ilmiah, mengevaluasi dan merancang penyelidikan ilmiah, serta menafsirkan data dan bukti ilmiah. Metode yang digunakan adalah kuasi eksperimen dengan desain *pretest-posttest control group design*. Sampel terdiri dari dua kelas, yaitu kelas eksperimen yang mendapat perlakuan model PBL dengan *PhET Simulation*, dan kelas kontrol yang menggunakan pembelajaran konvensional. Data diperoleh melalui tes literasi sains dan angket respon peserta didik. Hasil analisis menunjukkan bahwa terdapat perbedaan signifikan antara peningkatan literasi sains kelas eksperimen dan kontrol. Indikator menafsirkan data dan bukti ilmiah mengalami peningkatan paling tinggi, didukung oleh hasil angket yang menunjukkan bahwa *PhET Simulation* membantu peserta didik memahami hubungan antarvariabel dan membaca grafik serta data visual. Sementara itu, indikator mengevaluasi dan merancang penyelidikan ilmiah menunjukkan peningkatan paling rendah, terutama di kelas kontrol, akibat minimnya kegiatan investigatif. Simpulan dari penelitian ini adalah model PBL berbantuan *PhET Simulation* efektif dalam meningkatkan literasi sains peserta didik, terutama dalam indikator menafsirkan data dan bukti ilmiah.

Kata kunci :literasi sains, PBL, perubahan iklim, *PhET Simulation*

ABSTRACT

THE EFFECTIVENESS OF THE PROBLEM-BASED LEARNING (PBL) MODEL ASSISTED BY PHET SIMULATIONS ON STUDENTS' SCIENTIFIC LITERACY IN CLIMATE CHANGE TOPIC

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This study aims to examine the effectiveness of the Problem-Based Learning (PBL) model assisted by PhET simulations on students' scientific literacy in the context of climate change material. The scientific literacy assessed includes three main indicators: explaining phenomena scientifically, evaluating and designing scientific investigations, and interpreting data and scientific evidence. The research employed a quasi-experimental method with a pretest-posttest control group design. The sample consisted of two classes: an experimental class that received PBL instruction assisted by PhET simulations, and a control class that received conventional instruction. Data were collected through scientific literacy tests and student response questionnaires. The analysis results revealed a significant difference in the improvement of scientific literacy between the experimental and control classes. The indicator of interpreting data and scientific evidence showed the highest improvement, supported by questionnaire results indicating that PhET simulations helped students understand variable relationships and interpret graphs and visual data. In contrast, the indicator of evaluating and designing scientific investigations showed the lowest improvement, particularly in the control class, due to the limited investigative activities. The study concludes that the PBL model assisted by PhET simulations is effective in enhancing students' scientific literacy, especially in interpreting data and scientific evidence.

Keywords: *Science Literacy, PBL, Climate Change, PhET Simulation*