

ABSTRAK

PEPRINA SARI: Pengaruh Model Pembelajaran *Guided Inquiry* berbantuan *PhET Simulations* terhadap kemampuan Literasi Sains Siswa. **Program Studi Pendidikan Fisika FKIP Un iversitas Malikussaleh, 2025.**

Penelitian ini bertujuan untuk mengetahui pengaruh Model Pembelajaran *Guided Inquiry* berbantuan *PhET Simulations* terhadap kemampuan literasi sains siswa kelas XI SMA Negeri 1 Sawang pada mata pelajaran fisika.

Penelitian ini merupakan penelitian kuantitatif dengan desain penelitian *quasi eksperimental* yang berbentuk *Nonequivalen Control Group Design*. Populasi pada penelitian ini adalah kelas XI SMA N 1 Sawang yang terdiri dari empat kelas. Teknik pengambilan sampel yang dilakukan adalah teknik *purposive sampling* yaitu kelas XI-3 sebagai kelas eksperimen menggunakan model pembelajaran *Guided Inquiry* berbantuan *PhET Simulations* dan kelas XI-4 sebagai kelas kontrol menggunakan model pembelajaran konvensional berbantuan LKPD, dengan sampel berjumlah 25 siswa pada masing-masing kelas. Teknik pengumpulan data pada penelitian ini adalah tes tertulis, observasi, dan wawancara. Sedangkan instrument yang digunakan adalah soal *pretest-posttest*, lembar hasil wawancara, dan lembar observasi. Data yang diperoleh dianalisis menggunakan analisis deskriptif dan inferensial melalui pengumpulan data dan penarikan kesimpulan.

Berdasarkan hasil penelitian, diperoleh nilai rata-rata *pretest* pada kelas eksperimen sebesar 57,4, dan nilai rata-rata *posttest* mencapai 83. Sementara itu, pada kelas kontrol diperoleh nilai rata-rata *pretest* sebesar 57,8 dengan nilai rata-rata *posttest* mencapai 72,2. Peningkatan capaian hasil literasi sains siswa yang lebih tinggi pada kelas eksperimen mengindikasikan bahwa penerapan model pembelajaran *Guided Inquiry* berbantuan *PhET Simulations* memberikan pengaruh yang lebih baik terhadap kemampuan literasi sains siswa. Hal ini diperkuat dengan hasil analisis statistik menggunakan independent sample t- test yang menghasilkan nilai Sig. (2-tailed) sebesar 0,001 serta uji F yang menghasilkan nilai 0,000 melalui *SPSS Versi 27*. Kedua nilai signifikansi tersebut lebih kecil dari $\alpha = 0,05$, yang menunjukkan bahwa H_0 ditolak dan H_a diterima. Sehingga dapat disimpulkan bahwa terdapat pengaruh model pembelajaran *Guided Inquiry* berbantuan *PhET Simulations* terhadap literasi sains siswa pada materi usaha dan energi. Peneliti selanjutnya diharapkan dapat mengeksplorasi strategi ini lebih mendalam untuk meningkatkan literasi sains pada indikator mengidentifikasi isu-isu ilmiah, menjelaskan fenomena ilmiah, dan menggunakan bukti ilmiah, karena dalam penelitian ini peningkatan paling tinggi hanya terlihat pada indikator menggunakan bukti ilmiah.

Kata Kunci: *guided inquiry*, *phet simulations*, literasi sains

ABSTRACT

Peprina Sari: The effect of the Guided Inquiry Learning Model Assisted by PhET Simulations on students' Science Literacy skills. **Physics Education Study Program, FKIP Malikussaleh University, 2025.**

This study aims to determine the influence of the Guided Inquiry Learning Model assisted by PhET Simulations on the science literacy ability of grade XI students of SMA Negeri 1 Sawang in physics subjects.

This study is a quantitative research with a quasi-experimental research design in the form of a Nonequivalent Control Group Design. The population in this study is class XI of SMA N 1 Sawang which consists of four classes. The sampling technique carried out was a purposive sampling technique, namely class XI-3 as an experimental class using the Guided Inquiry learning model assisted by PhET Simulations and class XI-4 as a control class using a conventional learning model assisted by LKPD, with a sample of 25 students in each class. The data collection techniques in this study were written tests, observations, and interviews. Meanwhile, the instruments used are pretest-posttest questions, interview result sheets, and observation sheets. The data obtained were analyzed using descriptive and inferential analysis through data collection and conclusion drawn.

Based on the results of the study, the average pretest score in the experimental class was 57.4, and the average posttest score reached 83. Meanwhile, in the control class, the average pretest score was 57.8 with an average posttest score of 72.2. The increase in the achievement of higher student science literacy results in the experimental class indicates that the application of the Guided Inquiry learning model assisted by PhET Simulations has a better influence on students' science literacy skills. This is strengthened by the results of statistical analysis using an independent sample t-test which produces a Sig. (2-tailed) value of 0.001 and the F test which produces a value of 0.000 through SPSS Version 27. Both significance values are less than $\alpha = 0.05$, which indicates that H_0 rejected and H_a accepted. So it can be concluded that there is an influence of the Guided Inquiry learning model assisted by PhET Simulations on students' science literacy in business and energy materials. Researchers are expected to explore this strategy more deeply to improve science literacy in indicators identifying scientific issues, explaining scientific phenomena, and using scientific evidence, because in this study the highest increase is only seen in indicators using scientific evidence. So it can be concluded that there is an influence of the Guided Inquiry learning model assisted by PhET Simulations on students' science literacy in business and energy materials. Researchers are expected to explore this strategy more deeply to improve science literacy in indicators identifying scientific issues, explaining scientific phenomena, and using scientific evidence, because in this study the highest increase is only seen in indicators using scientific evidence.

Keywords: guided inquiry phet simulations, science, literacy