

## ABSTRAK

### EFEKTIVITAS PEMBELAJARAN *DISCOVERY* BERBASIS SIMULASI MOLEKUL UNTUK MENINGKATKAN KEMAMPUAN INTERPRETASI MAKNA REPRESENTASI KIMIA PADA MATERI HUKUM DASAR KIMIA

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Penelitian ini bertujuan untuk mendeskripsikan efektivitas model pembelajaran *discovery* berbasis simulasi molekul dalam meningkatkan kemampuan interpretasi makna representasi kimia siswa pada materi hukum dasar kimia. Metode dalam penelitian menggunakan desain penelitian *Pretest-Posttest Control Group Design*. Populasi dalam penelitian ini adalah seluruh siswa kelas X di SMA N 1 Katibung Kabupaten Lampung Selatan Tahun Pelajaran 2024/2025. Sampel dalam penelitian ini adalah kelas X Merdeka 2 sebagai kelas eksperimen dan X Merdeka 3 sebagai kelas kontrol yang didapatkan dari teknik sampling *cluster random sampling*. Teknik analisis data yang digunakan adalah uji perbedaan dua rata-rata dengan uji t. Hasil penelitian menunjukkan bahwa rata-rata *n-gain* bernilai 0,75 atau berkriteria tinggi di kelas eksperimen. Hasil uji t menunjukkan nilai rata-rata *n-gain* kemampuan interpretasi makna representasi kimia siswa di kelas eksperimen lebih tinggi dari nilai rata-rata *n-gain* kemampuan interpretasi makna representasi kimia siswa di kelas kontrol pada materi hukum dasar kimia. Berdasarkan hasil penelitian maka dapat disimpulkan bahwa model pembelajaran *discovery* berbasis simulasi molekul efektif dalam meningkatkan kemampuan interpretasi makna representasi kimia pada materi hukum dasar kimia.

**Kata kunci:** pembelajaran *discovery* berbasis simulasi molekul, hukum dasar kimia, kemampuan interpretasi makna representasi kimia, simulasi molekul, representasi kimia.

## ABSTRACT

### THE EFFECTIVENESS OF SIMULATION-BASED *DISCOVERY* LEARNING TO ENHANCE THE ABILITY TO INTERPRET THE MEANING OF CHEMICAL REPRESENTATIONS ON FUNDAMENTAL CHEMICAL LAWS

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This study aims to describe the effectiveness of the *discovery* learning model based on molecular simulations in enhancing students' ability to interpret the meaning of chemical representations on the topic of fundamental chemical laws. The research used a Pretest-Posttest Control Group Design. The population of this study consisted of all tenth-grade students at SMA N 1 Katibung, South Lampung, for the 2024/2025 academic year. The samples were taken from the X Merdeka 2 class as the experimental group and the X Merdeka 3 class as the control group, selected through cluster random sampling. The data analysis used a t-test for comparing two means. The results showed that the average n-gain in the experimental group was 0.75, which is categorized as high. The t-test revealed that the average n-gain in students' ability to interpret the meaning of chemical representations in the experimental class was higher than that in the control class for the topic of fundamental chemical laws. Based on these findings, it can be concluded that the *discovery* learning model based on molecular simulations is effective in improving the ability to interpret the meaning of chemical representations in the context of fundamental chemical laws.

**Keywords:** simulation-based *discovery* learning, fundamental chemical laws, ability to interpret chemical representations, molecular simulations, chemistry representation