

ABSTRACT

EFFECTIVENESS OF MOLECULAR SIMULATION-ASSISTED DISCOVERY LEARNING TO IMPROVE THE ABILITY TO INTERLEVEL TRANSLATION REPRESENTATION ON STOICHIOMETRY MATERIAL

By

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This study aims to describe the effectiveness of discovery learning assisted molecular simulation to improve interlevel translation ability representation on stoichiometry material and describe the profile of interlevel translation ability of representation on stoichiometry material. This research used quasi-experimental method with the matching-only pretest-posttest control group design. The population in this study were all class X students of SMAN 2 Metro in the 2022/2023 academic year. Discovery learning assisted by molecular simulation was applied to the experimental class. The data analysis technique used is the difference test of two means with independent sample t-test or t-test. The profile of interlevel translation ability is determined based on the representation ability category scale.

The average n-gain value of discovery learning assisted by molecular simulation was 0,7 with high criteria. The t-test results show that the average n-gain value in the class that applied discovery learning assisted by molecular simulation is higher than the class that applied discovery learning. The results of the profile of interlevel representation translation ability were obtained, namely students categorized as very good 15.1/5%, good 75.85%, and sufficient 9%. Based on the results of the study, it can be concluded that discovery learning assisted by molecular simulation is effective to improve the ability of interlevel representation translation in stoichiometry material.

Keywords: Discovery learning, interlevel translation ability, molecular simulation, stoichiometry

ABSTRAK

EFEKTIVITAS PEMBELAJARAN *DISCOVERY* BERBANTUAN SIMULASI MOLEKUL UNTUK MENINGKATKAN KEMAMPUAN TRANSLASI ANTARLEVEL REPRESENTASI PADA MATERI STOIKIOMETRI

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Penelitian ini bertujuan untuk mendeskripsikan efektivitas pembelajaran *discovery* berbantuan simulasi molekul untuk meningkatkan kemampuan translasi antarlevel representasi pada materi stoikiometri dan mendeskripsikan profil kemampuan translasi antarlevel representasi pada materi stoikiometri. Penelitian ini menggunakan metode kuasi eksperimen dengan desain penelitian *the matching-only pretest-posttest control group design*. Populasi dalam penelitian ini adalah seluruh siswa kelas X SMAN 2 Metro tahun pelajaran 2022/2023. Pembelajaran *discovery* berbantuan simulasi molekul diterapkan pada kelas eksperimen. Teknik analisis data yang digunakan yaitu uji perbedaan dua rata-rata dengan *independent sample t-test* atau uji t. Profil kemampuan translasi antarlevel ditentukan berdasarkan skala kategori kemampuan representasi.

Diperoleh nilai rata-rata *n-gain* pembelajaran *discovery* berbantuan simulasi molekul sebesar 0,7 ber kriteria tinggi. Hasil uji t menunjukkan bahwa rata-rata nilai *n-gain* pada kelas yang diterapkan pembelajaran *discovery* berbantuan simulasi molekul lebih tinggi daripada kelas yang diterapkan pembelajaran *discovery*. Didapatkan hasil profil kemampuan translasi antarlevel representasi yaitu siswa berkategori sangat baik 15,15%, baik 75,85%, dan cukup 9%. Berdasarkan hasil penelitian dapat disimpulkan bahwa pembelajaran *discovery* berbantuan simulasi molekul efektif untuk meningkatkan kemampuan translasi antarlevel representasi pada materi stoikiometri.

Kata kunci: Kemampuan translasi antarlevel representasi, pembelajaran *discovery*, simulasi molekul, stoikiometri