

ABSTRAK

Aprilla, Rabena. 2026. *Analisis Pemahaman Konsep Larutan Penyangga Peserta Didik Setelah Penerapan Model Inkuiri Terbimbing Berbantuan Laboratorium Virtual Chemcollective*. Skripsi. Tanjungpinang: Program Studi Pendidikan Kimia, Jurusan Pendidikan Matematika dan Ilmu Pengetahuan Alam, Fakultas Keguruan dan Ilmu Pendidikan, Universitas Maritim Raja Ali Haji. Pembimbing I: Dr.Fitriah Khoirunnisa, S.Pd., M.Ed. Pembimbing II: Nina Adriani, B.Sc(Hons)., M.Sc. Ph.D.

Kata Kunci: Inkuiri Terbimbing, *Chemcollective*, Larutan Penyangga, Permodelan Rasch.

Rendahnya literasi sains dan pemahaman konsep larutan penyangga pada peserta didik disebabkan oleh kompleksitas materi yang melibatkan integrasi konsep prasyarat dan pemahaman pada tingkat makroskopik, submikroskopik, serta simbolik yang abstrak. Penelitian ini bertujuan untuk mendeskripsikan profil kemampuan awal peserta didik, mendeteksi pergeseran kemampuan individu, serta menganalisis pemahaman konsep peserta didik setelah penerapan model inkuiri terbimbing berbantuan laboratorium virtual *ChemCollective* pada materi larutan penyangga. Penelitian pre-experimental ini menggunakan desain One Group *Pretest Posttest* dengan sampel jenuh sebanyak 15 peserta didik kelas XI. Data dianalisis menggunakan Permodelan Rasch untuk memetakan kemampuan individu dan tingkat kesulitan soal, serta uji Wilcoxon dan perhitungan *effect size* untuk menganalisis signifikansi peningkatan pemahaman konsep peserta didik. Hasil penelitian menunjukkan bahwa media *ChemCollective* sangat praktis digunakan (86,83%). Meskipun terdapat pergeseran positif pada nilai logit penguasaan konsep secara individual, hasil uji Wilcoxon menunjukkan nilai signifikansi 0,363 ($> 0,05$), yang mengindikasikan tidak adanya peningkatan pemahaman konsep yang signifikan secara statistik bagi kelompok secara keseluruhan. Ukuran efek yang dihasilkan juga tergolong kecil ($r = -0,166$). Disimpulkan bahwa setelah penerapan model inkuiri terbimbing berbantuan laboratorium virtual *ChemCollective*, peserta didik mengalami pergeseran pemahaman konsep ke arah positif, namun peningkatan tersebut belum signifikan secara statistik. Kondisi ini dipengaruhi oleh keterbatasan ukuran sampel, waktu adaptasi teknologi, lemahnya pemahaman materi prasyarat, dan faktor kelelahan peserta didik saat evaluasi.

ABSTRACT

Aprilla, Rabena. 2026. *Analysis of Students' Conceptual Understanding of Buffer Solutions Following the Implementation of a Guided Inquiry Model Assisted by the ChemCollective Virtual Laboratory*. Undergraduate Thesis. Tanjungpinang: Chemistry Education Study Program, Department of Mathematics and Natural Sciences Education, Faculty of Teacher Training and Education, Universitas Maritim Raja Ali Haji. Advisor I: Dr. Fitriah Khoirunnisa, S.Pd., M.Ed. Advisor II: Nina Adriani, B.Sc(Hons)., M.Sc. Ph.D.

Keywords: Guided Inquiry, *ChemCollective*, Buffer Solution, Rasch Modeling.

Low levels of scientific literacy and conceptual understanding of buffer solutions among students are attributed to the complexity of the material, which requires the integration of prerequisite concepts and understanding across macroscopic, submicroscopic, and abstract symbolic levels. This study aims to describe students' initial ability profiles, detect shifts in individual abilities, and analyze students' conceptual understanding after implementing a guided inquiry model supported by the ChemCollective virtual laboratory on the topic of buffer solutions. This pre-experimental study employed a One-Group Pretest-Posttest design with a saturated sample of 15 11th-grade students. The data were analyzed using Rasch modeling to map individual ability and item difficulty levels, as well as the Wilcoxon test and effect size calculations to analyze the significance of the increase in students' conceptual understanding. The results of the study showed that the ChemCollective medium was very practical to use (86.83%). Although there was a positive shift in individual logit scores for concept mastery, the results of the Wilcoxon test showed a p-value of 0.363 (> 0.05), indicating no statistically significant improvement in conceptual understanding for the group as a whole. The resulting effect size was also relatively small ($r = -0.166$). It is concluded that after implementing the guided inquiry model supported by the ChemCollective virtual laboratory, students experienced a positive shift in conceptual understanding; however, this improvement was not statistically significant. This outcome was influenced by the limited sample size, the time required to adapt to the technology, weak understanding of prerequisite material, and student fatigue during the evaluation.