

ABSTRAK

Ismanisa. NIM. 8186141003. Pengembangan Instrumen Asesmen *Higher Order Thinking Skills* (HOTS) Berbasis *Multiple Representasi* pada Materi Larutan Penyangga. Tesis. Medan: Program Studi Pendidikan Kimia, Pascasarjana Universitas Negeri Medan, 2020.

Penelitian ini bertujuan untuk (1) mengetahui hasil analisis kebutuhan instrumen asesmen *Higher Order Thinking Skills* (HOTS) berbasis *multiple representasi* pada materi larutan penyangga, (2) mengetahui kelayakan instrumen asesmen HOTS berbasis *multiple representasi* yang ditinjau dari *expert judgment*, (3) mengetahui hasil uji coba instrumen asesmen HOTS berbasis *multiple representasi* menggunakan model *Rasch*, (4) mengetahui tingkat kemampuan berpikir tingkat tinggi peserta didik yang diukur menggunakan instrumen asesmen HOTS berbasis *multiple representasi*, (5) mengetahui persepsi siswa tentang instrumen asesmen HOTS berbasis *multiple representasi* pada materi larutan penyangga. Pengembangan instrumen mengadopsi model 4-D dengan tahapan *define, design, develop, dan disseminate*. Subjek uji coba penelitian sebanyak 20 peserta didik. Produk ini diimplementasikan pada 38 siswa Kelas XI MAN 1 Medan. Desain uji coba terdiri dari uji validasi isi oleh para ahli dan dianalisis dengan formula Aiken's. Data dari hasil percobaan dianalisis dengan *Rasch* model. Hasil penelitian menunjukkan bahwa (1) Berdasarkan hasil analisis kebutuhan ditemukan bahwa peserta didik memiliki kemampuan berpikir yang beragam dan peserta didik juga belum terbiasa untuk menyelesaikan soal-soal HOTS pada level C4-C6 serta menganalisis indikator pengukuran pada materi larutan penyangga berdasarkan karakteristik *multiple representasi* termasuk aspek makroskopik, sub-mikroskopis, simbolik, dan matematis; (2) instrumen asesmen HOTS terdiri dari 30 item soal pada materi larutan penyangga, berbasis *multiple representasi* yang memiliki validitas item tinggi (0.90) dan validitas isi oleh para ahli yang tinggi (0.86); (3) karakteristik instrumen HOTS diperoleh reliabilitas yang cukup (0,69), tingkat kesulitan sedang, daya pembeda (66.67%) dan pengecoh (63.33%) yang baik; (4) profil kemampuan berpikir tingkat tinggi peserta didik dikategorikan rendah. Indikator HOTS yang dicapai oleh siswa dari tertinggi ke rendah secara berurutan adalah C4, C5, dan C6; (5) hasil analisis respons siswa terhadap instrumen asesmen HOTS diperoleh 61.21% siswa memberikan respons positif. Dengan demikian, kesimpulan dari penelitian pengembangan ini adalah telah dihasilkan instrumen asesmen HOTS berbasis *multiple representasi* yang sesuai dengan kriteria kelayakan sebagai instrumen asesmen HOTS dan produk instrumen asesmen HOTS ini dapat digunakan untuk mengukur tingkat kemampuan berpikir tingkat tinggi peserta didik.

Kata Kunci: HOTS, *multiple representasi*, *rasch* model, model 4-D, larutan penyangga.

ABSTRACT

Ismanisa. NIM. 8186141003. Development of Instruments Assessment Higher Order Thinking Skills (HOTS) Based on Multiple Representations on Buffer Solution. Thesis. Medan: Department of Chemistry Education, Postgraduate of State University of Medan, 2020.

This study aims to (1) know the results of the needs analysis of instruments assessment Higher Order Thinking Skills (HOTS) based on multiple representations on buffer solution, (2) determine the feasibility of the instruments assessment HOTS based on multiple representations in terms of expert judgment, (3) knowing the results of testing the instruments assessment HOTS based on multiple representations use Rasch model, (4) knowing the level of Higher Order Thinking Skills of students as measured using the instrument assessment HOTS based on multiple representations, (5) knowing the students' perceptions of the instrument assessment HOTS based on multiple representations on the buffer solution subject. The development of the instrument assessment adopted the 4-D model with the stages of define, design, develop, and disseminate. The research trial subjects included 20 students. The product was implemented in 38 students of class XI MAN 1 Medan. The trial design consists of product content validation is proven by expert judgment and analyzed with the Aiken's formula. The data of the trial results were analyzed with the Rasch model. The results showed that the (1) Based on the results of the needs analysis it was found that students have diverse thinking skills and students are also not used to solving HOTS questions at the C4-C6 level and analyzing measurement indicators on the buffer solution material based on multiple representation characteristics including macroscopic aspects, sub -microscopic, symbolic, and mathematical; (2) the HOTS assessment instrument consisted of 30 items on the buffer solution material, based on multiple representations which had high item validity (0.90) and high content validity by experts (0.86); (3) characteristics of the instruments have sufficient reliability (0.69), moderate difficulty level, good discrimination (66.67%) and distractor (63.33%); (4) profile of Higher Order Thinking Skills is categorized as low. HOTS indicators achieved by students from highest to low in sequence are C4, C5, and C6; (5) the results of the analysis of students' responses to the instrument assessment HOTS obtained by 61.21% of students gave a positive response. So, the conclusion of this development research is that the instrument assessment HOTS based on multiple representations has been produced that is in accordance with the eligibility criteria as a instrument assessment HOTS and the product of instrument assessment HOTS can be used to measure the level of higher order thinking skills students.

Keywords: HOTS, multiple representation, rasch models, model 4-D, buffer solution.