

## ABSTRAK

**Gabriela Selomita Rumondor. 2026. Pengembangan Soal Numerasi Pada Konten Geometri Dan Pengukuran Berbantuan *Desmos* Untuk Mengidentifikasi *Visual Thinking* Siswa SMP. Skripsi. Program Studi Pendidikan Matematika, Jurusan Pendidikan Matematika dan Ilmu Pengetahuan Alam, Fakultas Keguruan dan Ilmu Pendidikan, Universitas Sanata Dharma Yogyakarta.**

Penelitian ini dilatarbelakangi oleh rendahnya kemampuan numerasi siswa pada konten geometri dan pengukuran, serta masih terbatasnya penggunaan soal numerasi yang dapat mengidentifikasi *visual thinking*. Penelitian ini bertujuan untuk: (1) mengembangkan soal numerasi pada konten geometri dan pengukuran berbantuan *Desmos* untuk mengidentifikasi *visual thinking* siswa SMP, (2) mengetahui kualitas soal yang dikembangkan, dan (3) untuk mengidentifikasi adanya indikator *visual thinking* pada siswa SMP. Subjek penelitian adalah siswa kelas VIII SMP Kanisius Gayam Yogyakarta. Teknik pengumpulan data dilakukan melalui wawancara, validasi ahli, angket, dan tes. Data dianalisis secara kualitatif dan kuantitatif untuk menilai kevalidan, kepraktisan, kualitas butir soal, serta keefektifan produk. Hasil penelitian menunjukkan bahwa (1) sebanyak 25 soal sudah dikembangkan mengikuti tahapan 4D sampai *Develop* yang dilanjutkan dengan evaluasi formatif Tessler, meliputi *preliminary*, *self evaluation*, *expert review*, *one-to-one*, *small group*, dan *field test*., (2) kualitas soal berdasarkan analisis empiris memperoleh 18 butir valid dan 7 tidak valid, reliabilitas sebesar 0,417 (dikotomi), 0,506 (PGK), dan 0,194 (uraian), tingkat kesukaran diperoleh 2 butir soal mudah, 14 butir sedang, dan 9 butir sukar, daya pembeda diperoleh 3 butir soal baik, 9 butir cukup, dan 13 butir jelek, lalu efektivitas pengecoh diperoleh pada soal PG 4 butir soal sangat baik dan 1 butir tidak baik, serta pada soal PGK 10 butir soal berfungsi., (3) hasil *field test* menunjukkan bahwa penggunaan soal numerasi berbantuan *Desmos* dapat mengidentifikasi ketercapaian *visual thinking* siswa SMP, dimana berdasarkan kategori ketercapaian sebagian besar siswa sudah cukup mampu pada indikator *looking*, *seeing*, dan *imagining*, serta sudah mampu dengan baik pada indikator *showing & telling*.

**Kata kunci:** pengembangan, soal numerasi, geometri dan pengukuran, *desmos*, *visual thinking*

## **ABSTRACT**

**Gabriela Selomita Rumondor. 2026. *Development of Numeracy Questions on Geometry and Measurement Content Using Desmos to Identify Visual Thinking Among Junior High School Students. Undergraduate Thesis. Mathematics Education Study Program, Department of Mathematics Education and Natural Sciences, Faculty of Teacher Training and Education, Sanata Dharma University, Yogyakarta.***

*This study was motivated by students' low numeracy skills in geometry and measurement, as well as the limited use of numeracy problems that can identify visual thinking. This study aims to: (1) develop numeracy problems in geometry and measurement using Desmos to identify visual thinking among junior high school students, (2) determine the quality of the developed problems, and (3) to identify indicators of visual thinking among middle school students. The research subjects were eighth-grade students at Kanisius Gayam Junior High School in Yogyakarta. Data collection techniques included interviews, expert validation, questionnaires, and tests. The data were analyzed qualitatively and quantitatively to assess the validity, practicality, quality of the test items, and the effectiveness of the product. The results of the study indicate that (1) a total of 25 questions were developed following the 4D stages up to the "Develop" phase, followed by Tessmer's formative evaluation, which included preliminary, self-evaluation, expert review, one-to-one, small group, and field tests; (2) Based on empirical analysis, the quality of the questions yielded 18 valid items and 7 invalid items; reliability was 0.417 (dichotomous), 0.506 (multiple-choice), and 0.194 (essay); in terms of difficulty, there were 2 easy items, 14 of moderate difficulty, and 9 of high difficulty; discriminative power showed 3 items with good discriminative power, 9 with adequate power, and 13 with poor power; and the effectiveness of distractors showed that among the multiple-choice questions, 4 items had very good distractors and 1 had poor distractors, while among the multiple-choice with explanations, 10 items had effective distractors; (3) The results of the field test show that the use of Desmos assisted numeracy questions can identify the level of visual thinking achievement among junior high school students; based on the achievement categories, the majority of students demonstrated sufficient proficiency in the looking, seeing, and imagining indicators, and demonstrated strong proficiency in the showing & telling indicators.*

**Keywords:** *development, numeracy problems, geometry and measurement, desmos, visual thinking*