ABSTRAK

Hanifah Syahdana, 2025. Pengembangan Soal Pemodelan Fungsi Linear dan Non-linear Berbasis Masalah Kontekstual dengan *GeoGebra* untuk Memfasilitasi *Visual Thinking*, Skripsi. Program Studi Pendidikan Matematika, Jurusan Pendidikan Matematika dan Ilmu Pengetahuan Alam, Fakultas Keguruan dan Ilmu Pendidikan. Universitas Sanata Dharma.

Matematika masih dianggap sulit oleh siswa karena konsepnya abstrak, kurang kontekstual, serta minim eksplorasi visualisasi terutama pada materi pemodelan fungsi linear dan non linear. *Visual thinking* menjadi alternatif solusi karena mendorong siswa mengamati, memahami, membayangkan, dan merepresentasikan informasi secara visual. Untuk mendukung hal tersebut, diperlukan perangkat pembelajaran yang menantang siswa untuk berpikir aktif dan kritis. Soal menjadi media yang efektif untuk mendorong eksplorasi konsep, pemodelan, dan visualisasi. Penelitian ini mengembangkan soal pemodelan fungsi linear dan non-linear berbasis masalah kontekstual dengan *GeoGebra* untuk memfasilitasi visual *thinking* siswa.

Tujuan penelitian ini adalah mengembangkan soal dan menilai kualitasnya dari aspek validitas dan kepraktisan. Penelitian menggunakan metode *Research and Development* (R&D) dengan model ADDIE, dengan subjek utama adalah SMA Negeri 1 Adipala. Teknik pengumpulan data meliputi wawancara, kuesioner, dan observasi, dengan instrumen berupa lembar validasi dan kepraktisan. Data dianalisis secara kuantitatif dan kualitatif.

Hasil tahap *analysis* adalah siswa mudah memahami visual, tetapi kesulitan memodelkan konteks, sehingga perlu soal untuk melatihnya. Tahap *design* menghasilkan rancangan satu paket soal beserta *GeoGebra* dan rubrik penilaian. Tahap *development* menghasilkan soal yang layak digunakan. Tahap *implementation* menunjukkan kepraktisan soal dari perspektif calon guru dan siswa. Hasil *evaluation* menunjukkan bahwa produk tergolong sangat layak dan praktis. Dilihat dari kualitas produk, soal yang dikembangkan tergolong sangat layak dan praktis. Hasil validasi menunjukkan bahwa soal tergolong “sangat layak” dengan skor rata-rata 4,79 dari satu dosen dan 4,94 dari dua guru. Kepraktisan soal dinilai “praktis” oleh empat calon guru (88,16%) dan 12 siswa (70,18%). Soal dinilai menarik, menantang, dan memfasilitasi *visual thinking*.

Kata Kunci: Pengembangan Soal, Pemodelan, Kontekstual, *GeoGebra*, *Visual Thinking*

ABSTRACT

Hanifah Syahdana, 2025. ***Development of Linear and Non-linear Function Modeling Questions Based on Contextual Problems with GeoGebra to Facilitate Visual Thinking, Thesis. Mathematics Education Study Program, Department of Mathematics and Natural Sciences Education, Faculty of Teacher Training and Education. Sanata Dharma University.***

Mathematics is still considered difficult by students because its concepts are abstract, lack context, and offer little opportunity for visual exploration, especially in the area of linear and non-linear function modeling. Visual thinking offers an alternative solution by encouraging students to observe, understand, imagine, and represent information visually. To support this, educational tools are needed that challenge students to think actively and critically. Questions serve as an effective medium to encourage exploration of concepts, modeling, and visualization. This study developed linear and nonlinear function modeling questions based on contextual problems using GeoGebra to facilitate students' visual thinking.

The purpose of this study was to develop questions and assess their quality in terms of validity and practicality. The study used the Research and Development (R&D) method with the ADDIE model, with the main subject is SMA Negeri 1 Adipala. Data collection techniques included interviews, questionnaires, and observations, with instruments in the form of validation and practicality sheets. Data were analyzed quantitatively and qualitatively.

The results of the analysis phase indicate that students easily understand visuals but struggle to model contexts, necessitating questions to practice this skill. The design phase produced a set of questions integrated with GeoGebra and a rubric for assessment. The development phase resulted in questions suitable for use. The implementation phase demonstrated the practicality of the questions from the perspectives of prospective teachers and students. Evaluation results indicate that the product is highly suitable and practical. In terms of product quality, the questions developed are considered very feasible and practical. The validation results indicate that the questions are classified as "highly suitable" with an average score of 4.79 from one lecturer and 4.94 from two teachers. The practicality of the questions was rated as "practical" by four prospective teachers (88.16%) and 12 students (70.18%). The questions were deemed interesting, challenging, and conducive to visual thinking.

Keywords: *Question Development, Modeling, Contextual, GeoGebra, Visual Thinking*