ABSTRAK

Agustina Budi Astuti, 2023. Pengembangan Video Pembelajaran Dan LKPD Berbasis *Geogebra* pada Materi Dimensi Tiga untuk Mengembangkan Kemampuan Representasi Matematis Siswa Kelas XII SMAN 1 Pundong. Program Studi Pendidikan Matematika, Jurusan Pendidikan Matematika dan Ilmu Pengetahuan Alam, Fakultas Keguruan dan Ilmu Pendidikan, Universitas Sanata Dharma.

Penelitian ini bertujuan untuk: 1) mendeskripsikan proses pengembangan video pembelajaran dan LKPD berbasis *GeoGebra* pada materi dimensi tiga untuk mengembangkan kemampuan representasi matematis dan 2) mendeskripsikan kualitas produk pengembangan ditinjau dari kevalidan dan keefektifan.

Metode penelitian ini adalah penelitian dan pengembangan dengan model pengembangan ADDIE (*Analyze, Design, Development, Implementation, Evaluation).* Subjek penelitian ini adalah 29 siswa kelas XII MIPA 2 SMAN 1 Pundong. Metode pengumpulan data penelitian adalah wawancara, uji validitas produk pengembangan, tes kemampuan representasi matematis, dan pengisian angket respon siswa. Teknik analisis data penelitian adalah penghitungan persentase tuntas dan rata-rata tes representasi matematis, rata-rata penilaian validasi produk pengembangan, dan rata-rata angket respon siswa.

Hasil penelitian ini adalah: 1) Proses pertama pengembangan video pembelajaran dan LKPD berbasis *GeoGebra* adalah analisis meliputi analisis permasalahan mengenai kesulitan siswa dalam representasi bangun ruang dimensi tiga. Kedua, desain meliputi perancangan konsep empat video pembelajaran dan LKPD tiga pertemuan. Ketiga, pengembangan meliputi pembuatan produk pengembangan yang valid dengan adanya beberapa revisi. Keempat, implementasi meliputi uji coba sebanyak empat pertemuan pada Bulan Oktober 2022. Kelima, evaluasi meliputi analisis hasil tes representasi matematis, angket respon siswa, dan terdapat revisi terkait suara video dan warna LKPD. 2) Produk pengembangan yang dihasilkan valid dan efektif. Untuk kevalidan, hasil validasi produk pengembangan baik dengan video pembelajaran memperoleh 4,36 dari 5 dan LKPD memperoleh 4,17 dari 5. Untuk keefektifan, hasil tes representasi matematis memperoleh rata-rata 82,3 dari 100 dan 79,3% siswa tuntas KKM. Hasil angket respon siswa terhadap produk pengembangan baik yaitu video pembelajaran sebesar 76% dan LKPD sebesar 77,2%.

Kata Kunci: video pembelajaran, LKPD, *GeoGebra*, representasi, dimensi tiga

ABSTRACT

Agustina Budi Astuti, 2023. Developing Videos and Student Worksheets Based on GeoGebra in Three Dimensional Topic to Improve Matematical Representation Ability of Grade XII of Senior High School 1 Pundong. Mathematics Education Study Program, Department of Mathematics Education and Natural Sciences, Faculty of Teacher Education and Training, Sanata Dharma University.

This study aims to: 1) Describing the process of developing GeoGebra-based learning videos and worksheets on three-dimensional material to develop mathematical representation skills and 2) Describing the quality of the development products regarding validity and effectiveness.

This research method is research and development with the ADDIE (Analyze, Design, Development, Implementation, Evaluation) development model. The subjects of this study were 29 students from class XII MIPA 2 ofundong Public Senior High School 1. The methods for collecting research data are interviews, testing the validity of product development, testing mathematical representation ability, and completing student response questionnaires. The Research data analytics techniques are calculating the percentage of completion and the average mathematical representation test, the average product development validation assessment, and the average student response questionnaire.

The results of this study are: 1) The first process of developing GeoGebra-based learning videos and worksheets is the analysis which includes analyzing problems related to students' difficulties in representing three-dimensional shapes. Second, the project includes concept definitions for four learning videos and three meeting worksheets. Third, the development includes building a good development product with multiple revisions. Fourth, the implementation includes the test of four meetings in October 2022. Fifth, the evaluation includes an analysis of the results of the mathematical representation test and the student response questionnaires, and there are reviews related to the sound of the video and the colors of the worksheets. 2) The resulting product development is valid and effective. For validity, the validation results of good product development with learning videos scored 4.36 out of 5, and worksheets scored 4.17 out of 5. For effectiveness, the mathematical representation test results scored an average of 82,3 from 100, and 79,3% of students passed KKM. The results of the student response questionnaire to the product development were good. There are learning videos at 76% and worksheets at 77,2%.

Keywords: *learning videos, worksheets, GeoGebra, representation, three dimensions*