

ABSTRACT

Development of Mathematical Learning Based Learning of Flipped Classroom in Improving Mathematical Reasoning Competence of Students on Trigonometry Material of Class X High School

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This study aimed to produce mathematics learning equipments based on Flipped Classroom that were valid, practical, and effective in improving the mathematical reasoning of the 10th grade senior high school students. The learning equipments developed were Learning Implementation Plan (RPP), learning video, and Student Working Sheet (LKPD) on Trigonometry topic for 10th grade senior high school.

Development of learning equipments followed the Plomp model consisting of three phases, namely initial investigation phase, prototype development phase, and assessment phase. The initial investigative phase aimed to collect the data that being the base of characteristic of the developed learning equipments. The prototype development phase aimed to develop learning equipments into valid and practical equipments through formative evaluation stages, self-evaluation, expert evaluation, one-to-one evaluation, small group evaluation, and large group evaluation. The assessment phase aimed to measure the level of effectiveness of learning equipments in improving students' mathematical reasoning abilities. The subjects of field test involved in this study were students and mathematics teachers of 10th grade public senior high school number six in Padang, 2016-2017 Academic Year. Instruments used during the study including interview guides, questionnaires, learning equipments validation sheets, learning implementation observation sheets, and students' reasoning skills tests. Before the instruments were used to collect data, the instruments were first validated by the validator.

The results of the analysis of the data from the RPP validation sheet, learning video and LKPD show that the developed learning equipments based on Flipped Classroom have been valid in terms of constructs and terms of content. Learning equipments based on flipped classroom that are developed are also practical in terms of implementation and the ease of use. This is based on the results of the analysis of the questionnaires of the students' responses, observation data of implementation learning, and interview data with teachers. In addition, learning equipments based on flipped classroom have also been effective in improving students' mathematical reasoning based on the data of reasoning test result that has been implemented, which is 78.125% of learners have obtained value above KKM that has been determined by school, that is 75. ii

ABSTRAK

Pengembangan Perangkat Pembelajaran Matematika Berbasis *Flipped classroom* dalam Meningkatkan Kemampuan Penalaran Matematis Peserta Didik Pada Materi Trigonometri Kelas X SMA

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Penelitian ini bertujuan untuk menghasilkan perangkat pembelajaran matematika berbasis *flipped classroom* yang valid, praktis, dan efektif dalam meningkatkan penalaran matematis peserta didik kelas X SMA. Perangkat pembelajaran yang dikembangkan ialah Rencana Pelaksanaan Pembelajaran (RPP), video pembelajaran, dan Lembar Kerja Peserta Didik (LKPD) pada materi Trigonometri kelas X SMA.

Pengembangan perangkat pembelajaran mengikuti model Plomp yang terdiri dari tiga fase yaitu fase investigasi awal, fase pengembangan *prototype*, dan fase penilaian. Fase investigasi awal bertujuan untuk mengumpulkan data yang menjadi dasar karakteristik perangkat pembelajaran yang dikembangkan. Fase pengembangan *prototype* bertujuan untuk mengembangkan perangkat pembelajaran menjadi perangkat yang valid dan praktis melalui tahapan evaluasi formatif, yaitu evaluasi sendiri, evaluasi oleh pakar, evaluasi satu-satu, evaluasi kelompok kecil, dan evaluasi kelompok besar. Fase penilaian bertujuan untuk mengukur tingkat efektivitas perangkat pembelajaran dalam meningkatkan kemampuan penalaran matematis peserta didik. Subjek uji lapangan yang dilibatkan dalam penelitian ini adalah peserta didik dan guru matematika kelas X SMA Negeri 6 Padang Tahun Pelajaran 2016-2017. Instrumen yang digunakan selama penelitian berupa pedoman wawancara, angket, lembar validasi perangkat pembelajaran, lembar observasi keterlaksanaan pembelajaran dan tes kemampuan penalaran peserta didik. Sebelum instrumen digunakan untuk mengumpulkan data, instrumen terlebih dahulu divalidasi oleh validator.

Hasil analisis terhadap data dari lembar validasi RPP, video pembelajaran dan LKPD menunjukkan bahwa perangkat pembelajaran berbasis *flipped classroom* yang dikembangkan telah valid dari segi konstruk dan segi isi. Perangkat pembelajaran berbasis *flipped classroom* yang dikembangkan juga praktis dari segi keterlaksanaan dan kemudahan dalam penggunaan. Hal ini didasari pada hasil analisis terhadap data angket respon pesera didik, data observasi keterlaksanaan pembelajaran, dan data wawancara dengan guru. Selain itu, perangkat pembelajaran berbasis *flipped classroom* juga telah efektif dalam meningkatkan penalaran matematis peserta didik berdasarkan data hasil tes penalaran yang telah dilaksanakan, yaitu 78,125% peserta didik telah memperoleh nilai di atas KKM yang ditentukan sekolah yaitu 75.