ABSTRAK

Trionanda, Stevanus. 2022. Analisa Kemampuan Pemecahan Masalah Siswa Kelas IV SD Katolik Tanjungpinang pada Materi Pecahan Setelah Mengalami Proses Pembelajaran dengan Menggunakan Pendekatan PMR dengan Strategi *Flipped Classroom*. Tesis. Program Studi Magister Pendidikan Matematika, Jurusan Pendidikan Matematika dan Ilmu Pengetahuan Alam, Fakultas Keguruan dan Ilmu Pendidikan, Universitas Sanata Dharma, Yogyakarta.

Penelitian ini bertujuan untuk mendeskripsikan bagaimana proses merencanakan dan mengimplementasikan pembelajaran berbasis *hypothetical learning trajectory* (HLT) menggunakan pendekatan pendidikan matematika realistik (PMR) dengan strategi *flipped classroom* untuk membelajarkan materi Pecahan untuk siswa Kelas IV di SD Katolik Tanjungpinang serta mendeskripsikan kemampuan pemecahan masalah siswa setelah mereka belajar materi Pecahan dengan pendekatan PMR dan strategi *flipped classroom*.

Jenis penelitian yang dilakukan adalah penelitian desain yang bertujuan mengembangkan instrumen pembelajaran secara teoritis dan secara empiris. Subjek penelitian adalah siswa SD Katolik Tanjungpinang kelas IV A dan IV B. Instrumen pengumpulan data dalam penelitian ini adalah catatan harian, tes tertulis, dan pedoman wawancara. Langkah – langkah analisis data dalam penelitian ini adalah sebagai berikut reduksi data, penyajian data, dan membuat kesimpulan dan/atau memverifikasi.

Penelitian ini menghasilkan rancangan lintasan belajar untuk materi pecahan menggunakan pendekatan PMR dan strategi *flipped classrooms*. Langkah-langkah implementasi pembelajaran PMR dan strategi *flipped classroom* pada materi Pecahan adalah sebagai berikut: (1) pra-pertemuan: peneliti melakukan perkenalan terhadap subjek penelitian, menjelaskan kegiatan yang dilakukan siswa selama 4 pertemuan atau 2 minggu kedepan dari tahap belajar mandiri, tahap belajar sinkronus, dan tahap transfer, dan menjelaskan aturan belajar yang akan dilakukan pada saat tahap belajar sinkronus, (2) pertemuan 1: peneliti memberikan video pembelajaran 1 dan meminta siswa mempelajari dan mengerjakan tugas dalam video, melaksanakan pembelajaran sinkronus untuk mempelajari pecahan sebagai bagian dari keseluruhan dan sebagai hasil pembagian, dan melaksanakan tahap transfer untuk mengembangkan pemahaman siswa mengenai materi pecahan sebagai bagian dari keseluruhan dan sebagai hasil pembagian, (3) pertemuan 2: peneliti memberikan video pembelajaran 2 dan meminta siswa mempelajari dan mengerjakan tugas dalam video, melaksanakan pembelajaran sinkronus untuk mempelajari pecahan senilai, dan melaksanakan tahap transfer untuk mengembangkan pemahaman siswa mengenai materi pecahan senilai, (4) pertemuan 3: peneliti memberikan video pembelajaran 3 dan meminta siswa mempelajari dan mengerjakan tugas dalam video, melaksanakan pembelajaran sinkronus untuk mempelajari penyederhanaan pecahan, dan melaksanakan tahap transfer untuk mengembangkan pemahaman siswa mengenai materi penyederhanaan pecahan, (5) pertemuan 4: peneliti memberikan video pembelajaran 4 dan meminta siswa mempelajari dan mengerjakan tugas dalam video, melaksanakan pembelajaran sinkronus untuk mempelajari pecahan campuran, dan melaksanakan tahap transfer untuk mengembangkan pemahaman siswa mengenai materi pecahan campuran. Pelaksanaan implementasi pembelajaran ini telah memenuhi karakteristik PMR yaitu

eksplorasi fenomologi, matematisasi bertahap, menggunakan konstruksi siswa, interaktivitas, dan keterhubungan.

Kemampuan pemecahan masalah yang dideskripsikan dalam penelitian ini adalah kemampuan siswa untuk memahami masalah, membuat rencana, melaksanakan rencana, dan melihat kembali. Berdasarkan hasil tes tertulis untuk kelas uji coba didapat bahwa 34% siswa memenuhi empat indikator kemampuan pemecahan masalah, 17% siswa memenuhi tiga indikator kemampuan pemecahan masalah, 27% siswa memenuhi dua indikator kemampuan pemecahan masalah, 13% siswa memenuhi satu indikator kemampuan pemecahan masalah, dan 9% siswa tidak memenuhi satupun indikator kemampuan pemecahan masalah. Berdasarkan hasil tes tertulis untuk kelas eksperimen didapat bahwa 39% siswa memenuhi empat indikator kemampuan pemecahan masalah, 12% siswa memenuhi tiga indikator kemampuan pemecahan masalah, 26% siswa memenuhi dua indikator kemampuan pemecahan masalah, 12% siswa memenuhi satu indikator kemampuan pemecahan masalah, dan 11% siswa tidak memenuhi satupun indikator kemampuan pemecahan masalah.

Kata Kunci*:* kemampuan pemecahan masalah, penelitian desain, pendidikan matematika realistik, *flipped classroom*, pecahan

ABSTRACT

Trionanda, Stevanus. 2022. Analysis of Class IV Catholic Elementary School Students' Problem Solving Abilities on the Topic of Fractions after Learning using RME Approach with Flipped Classroom Strategy. Thesis. Master of Mathematics Education Study Program, Department of Mathematics and Science Education, Faculty of Teacher Training and Education, Sanata Dharma University, Yogyakarta.

This study aims were to describe the process to design and implement learning trajectory-based instruction Realistic Mathematics Education (RME) approach with flipped classroom strategy to teach grade IV Tanjungpinang Catholic School students on the topic of fractions. This study also aims were to describe students'problem solving abilities after they learnt with Realistic Mathematics Education (RME) approach with flipped classroom strategy.

The type of this study was the design research which aim was to develop a learning instrument theoretically and empirically. The subjects of this research were grade IV A and IV B from Tanjungpinang Catholic Elementary School. The instruments used in this research were daily notes, written test, and interview guidelines. The steps of data analysis in this study are as follows: data reduction, data presentation, and making conclusions and/or verifying.

The results of this study were a learning trajectory-based instruction using RME and flipped classroom that was used to teach simplification of fractions. The phases of the learning trajectory-based instruction Realistic Mathematics Education (RME) approach with flipped classroom strategy were as follows: (1) pre-phase: the researcher introduced himself to research subjects, explained the things that students would do for the next four meetings or for the next two weeks, and explained the rules that students must follow during synchronous learning phase, (2) first meeting: the researcher gave out learning video 1 and asked students to study the video and worked on assignment at the end of the video, carried out synchronous learning phase to discuss fractions as a part of a whole and fraction as a result of division, and carries out transfer phase to deepen students' understanding about fractions as a part of a whole and fraction as a result of division, (3) second meeting: the researcher gave out learning video 2 and asked students to study the video and worked on assignment at the end of the video, carries out synchronous learning phase to discuss equal fractions, and carried out transfer phase to deepen students' understanding about equal fractions, (4) third meeting: the researcher gave out learning video 3 and asked students to study the video and work on assignment at the end of the video, carried out synchronous learning phase to discuss simplifying fractions, and carried out transfer phase to deepen students' understanding about simplifying fraction (5) fourth meeting: the researcher gave out learning video 1 and asked students to study the video and worked on assignment at the end of the video, carried out synchronous learning phase to discuss improper, and carried out transfer phase to deepen students' understanding about improper fractions. The implementation of this learning trajectory-based instructions also fulfilled the characteristics of RME such as phenomology exploration, mathematization, using students' constructions, interactivity, and intertwinement.

Problem solving abilities that were described in this research were students' ability to understand a problem, devising a plan, carried out the plan, and looked back. Based on students' written test in trial class, it was obtained that 34% of students fulfilled four problem solving ability indicators, 17% of students fulfilled three problem solving ability indicators, 27% of students fulfilled two problem solving indicators, 13% of students fulfilled one problem

solving indicator, and 9% of students didn't fulfill the problem solving indicator. Based on students' written test in experiment class it is obtained that 39% of students fulfilled four problem solving ability indicators, 12% of students fulfilled three problem solving ability indicators, 26% of students fulfilled two problem solving indicators, 12% of students fulfill one problem solving indicator, and 11% of students didn't fulfill the problem solving indicator.

Keywords: *problem solving abilities, design research, Realistic Mathematics Education, flipped classroom, fractions*