PENGEMBANGAN MODEL PEMBELAJARAN DENGAN PENDEKATAN STEM BERBANTUAN CAME BERDASARKAN HASIL META-ANALISIS DALAM UPAYA MENINGKATKAN KEMAMPUAN BERPIKIR MATEMATIS DAN MOTIVASI BELAJAR SISWA

DISERTASI

Diajukan untuk Memenuhi Sebagian dari Syarat
untuk Memperoleh Gelar Doktor Ilmu Pendidikan
dalam Bidang Pendidikan Matematika

Disusun Oleh
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PERNYATAAN KEASLIAN DISERTASI

Dengan ini saya menyatakan bahwa disertasi dengan judul "Pengembangan Model PBL Dengan Pendekatan STEM Berbantuan CAME Berdasarkan Hasil Meta-Analisis dalam Upaya Meningkatkan Kemampuan Berpikir Matematis dan Motivasi Belajar Siswa", beserta seluruh isinya adalah benar – benar karya saya sendiri. Saya tidak melakukan penjiplakan atau pengutipan dengan cara – cara yang tidak sesuai dengan etika ilmu yang berlaku dalam masyarakat keilmuan. Atas pernyataan ini, saya siap menanggung Tindakan/sanksi apabila dikemudian hari ditemukan adanya pelanggaran etika keilmuan atau ada klaim dari pihak lain terhadap keasilan karya saya ini.

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ABSTRAK

Andini Dwi Rachmawati. 2012903. Pengembangan Model PBL dengan Pendekatan STEM Berbantuan CAME dalam Upaya Meningkatkan Kemampuan Berpikir Matematis dan Motivasi Belajar Siswa.

Penelitian ini dilatarbelakangi oleh temuan beragam hasil penelitian mengenai pengaruh pendekatan STEM dan CAME terhadap kemampuan berpikir matematis siswa. Keberagaman hasil ini menunjukkan perlunya penelitian lanjutan yang lebih komprehensif untuk mengkaji efektivitas kedua pendekatan tersebut. Tujuan penelitian ini adalah untuk mengembangkan pendekatan pembelajaran inovatif yang menggabungkan STEM dan CAME untuk meningkatkan kemampuan berpikir matematis dan motivasi belajar siswa. Berdasarkan studi pendahuluan, ditemukan beberapa poin penting: Kemampuan komunikasi matematis dan representasi, sebagai dua aspek penting dalam kemampuan berpikir matematis, perlu dikaji ulang melalui pendekatan STEM dan CAME. Kombinasi STEM dan CAME diprediksi lebih efektif bila diimplementasikan pada jenjang sekolah menengah atas. Perbedaan hasil penelitian mengenai pengaruh STEM dan CAME terhadap kemampuan berpikir matematis dapat ditinjaklanjuti dengan studi meta-analisis. Penelitian ini menggunakan desain penelitian pengembangan dengan mengacu pada model Plomp. Pengembangan dilakukan dalam tiga tahap: Tahap pertama dilakukan penelitian pendahuluan (*preliminary research*). Tahap kedua yaitu pembuatan prototype (*prototyping phase*). Tahap ketiga yaitu tahap penilaian (*assessment phase*). Subjek penelitian ini adalah siswa dari tiga jenjang pendidikan, yaitu SD, SMP, dan SMA di Kabupaten Tulungagung pada semester ganjil tahun ajaran 2023/2024. Penentuan jenjang pendidikan didasarkan pada hasil meta-analisis. Populasi penelitian adalah seluruh siswa di tiga jenjang pendidikan tersebut. Teknik pengambilan dan ukuran sampel ditentukan berdasarkan hasil meta-analisis. Hasil penelitian menunjukkan bahwa pendekatan pembelajaran STEM berbantuan CAME terbukti valid, praktis, dan efektif dalam meningkatkan kemampuan berpikir matematis dan motivasi belajar siswa.

Kata kuci: STEM, CAME, kemampuan berpikir matematis, motivasi belajar, studi meta-analisis

ABSTRACT

Andini Dwi Rachmawati. 2012903. Development of a PBL Model with a STEM Approach Assisted by CAME in an Effort to Enhance Students' Mathematical Thinking Skills and Learning Motivation

This research is motivated by the diverse findings of previous studies on the impact of STEM and CAME approaches on students' mathematical thinking skills. This diversity of results indicates the need for further comprehensive research to examine the effectiveness of both approaches. The objective of this research is to develop an innovative learning approach that combines STEM and CAME to improve students' mathematical thinking skills and learning motivation. Mathematical communication and representation skills, as two important aspects of mathematical thinking skills, need to be re-examined through STEM and CAME approaches. The combination of STEM and CAME is predicted to be more effective when implemented at the upper secondary school level. The differences in research results on the influence of STEM and CAME on mathematical thinking skills may be due to variations in research methodology and design. This research uses a development research design with reference to the Plomp model. The development is carried out in three stages: preliminary research; prototyping phase; assessment phase. The subjects of this research are students from three educational levels, namely elementary school, junior high school, and senior high school in Tulungagung Regency in the odd semester of the 2023/2024 academic year. The determination of the educational level is based on the results of a meta-analysis. The research population is all students at the three educational levels. The sampling technique and sample size are determined based on the results of the meta-analysis. The research results are expected to show that the STEM learning approach assisted by CAME is valid, practical, and effective in improving students' mathematical thinking skills and learning motivation.

Keywords: STEM, CAME, mathematical thinking skills, learning motivation, meta-analysis

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