ANALISIS PENERAPAN PEMBELAJARAN STEM *QUARTET* DALAM MENINGKATKAN BERPIKIR KOMPUTASI SISWA SMA PADA TOPIK KALOR DAN PERPINDAHANNYA MENGGUNAKAN *TRANSCRIPT BASED LESSON ANALYSIS*

TESIS

diajukan untuk memenuhi sebagian syarat memperoleh gelar Magister Pendidikan Fisika

oleh

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PROGRAM STUDI PASCASARJANA PENDIDIKAN FISIKA

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PERNYATAAN

Dengan ini saya menyatakan bahwa tesis dengan judul "*ANALISIS PENERAPAN PEMBELAJARAN STEM QUARTET DALAM MENINGKATKAN BERPIKIR KOMPUTASI SISWA SMA PADA TOPIK KALOR DAN PERPINDAHANNYA MENGGUNAKAN TRANSCRIPT BASED LESSON ANALYSIS*" ini 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 risiko/sanksi apabila di kemudian hari ditemukan adanya pelanggaran etika keilmuan atau ada klaim dari pihak lain terhadap keaslian karya saya ini.

Bandung, Januari 2023

Yang membuat pernyataan,

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ANALISIS PENERAPAN PEMBELAJARAN STEM *QUARTET* DALAM MENINGKATKAN BERPIKIR KOMPUTASI SISWA SMA PADA TOPIK KALOR DAN PERPINDAHANNYA MENGGUNAKAN *TRANSCRIPT BASED LESSON ANALYSIS*

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ABSTRAK

Penelitian ini merupakan studi tentang analisis penerapan suatu pembelajaran STEM *Quartet* untuk meningkatkan kemampuan berpikir komputasi siswa SMA. Adapun Metode penelitian yang digunakan pada penelitian yaitu *Mixed Methods* dengan desain *embedded.* Instrumen penelitian yang digunakan yaitu instrumen tes dan non-tes. Instrumen tes terdiri dari 13 item soal pilihan ganda yang mengukur 5 aspek kemampuan berpikir komputasi (abstraksi, dekomposisi, pemikiran algoritma, evaluasi, dan generalisasi). Sedangkan instrumen non-tes terdiri dari transkrip video pembelajaran dan *evidence pembelajaran* berupa LKPD dan dokumentasi penilaian proyek oleh CodeMaster. Sampel penelitian ini terdiri dari 31 siswa di salah satu SMAN di Kota Subang. Karakteristik penerapan pembelajaran STEM *Quartet* dianalisis menggunakan metode transkripsi, peningkatan kemampuan berpikir komputasi dianalisis secara kuantitatif menggunakan pemodelan Rasch, profil keterampilan berpikir komputasi dianalisis berdasarkan hasil penilaian CodeMaster. Berdasarkan hasil transkripsi dan *evidence* pembelajaran diperoleh bahwa karakteristik pembelajaran STEM *Quartet* pada penelitian ini yaitu: menggunakan solusi sebagai *starting point* dalam pembelajaran, percakapan kelas masih didominasi oleh guru, memiliki potensi untuk melatihkan kemampuan berpikir komputasi, serta pembelajaran terintegrasi dengan proses sains dan *engineering practice.* Hasil penerapan pembelajaran STEM *Quartet* menunjukkan bahwa terdapat 29/31 siswa siswa mengalami peningkatan kemampuan berpikir komputasi. Profil Keterampilan berpikir komputasi berdasarkan penilaian proyek menunjukkan bahwa 5 dari 5 kelompok siswa memiliki kemampuan yang baik dalam membuat UI *(User Interface)* pada proyek simulasi dan proyek aplikasi.

Kata Kunci : STEM *Quartet, Berpikir Komputasi, Trancript based Lesson Analysis*

ANALYSIS OF THE APPLICATION OF STEM QUARTET IN IMPROVING HIGH SCHOOL STUDENT'S COMPUTATIONAL THINKING ON HEAT AND TRANSFER USING TRANSCRIPT BASED LESSON ANALYSIS

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ABSTRACT

This research is a study of the analysis of the application of a STEM Quartet to improve high school students' computational thinking skills. The research method used in this research is Mixed Methods with an embedded design. The research instruments used are test and non-test instruments. The test instrument consists of 13 items of multiple choice questions that measure 5 aspects of computational thinking ability (abstraction, decomposition, algorithmic thinking, evaluation, and generalization). While the non-test instruments consist of learning video transcripts and learning evidence in the form of worksheets and project assessment documentation by CodeMaster. The sample of this study consisted of 31 students at one of the SMAN in Subang City. Characteristics of the application of STEM Quartet learning were analyzed using the transcription method, increasing computational thinking ability were analyzed quantitatively using Rasch Model, profiles of computational thinking skills were analyzed based on the results of the CodeMaster assessment. Based on the results of the transcription and learning evidence, it was found that the characteristics of the STEM Quartet learning in this study were: using solutions as a starting point in learning, class conversations were still dominated by teachers, had the potential to train computational thinking ability, and integrated learning with science processes and engineering practice. The results of the application of STEM Quartet showed that there were 29/31 students who experienced an increase in computational thinking ability. Computational thinking skills profile based on project assessment shows that 5 out of 5 groups of students have good skills in making UI (User Interface) in simulation projects and application projects.

Keywords: STEM Quartet, Computational Thinking, Transcript based Lesson Analysis

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