PERKULIAHAN FISIKA DASAR DENGAN MODEL *ELICITING ACTIVITIES* BERBANTUAN MULTI REPRESENTASI UNTUK MENINGKATKAN KELANCARAN REPRESENTASI DAN KEMAMPUAN KOGNITIF MAHASISWA PROGRAM SARJANA TEKNIK ELEKTRO

DISERTASI

Diajukan untuk Memenuhi Sebagian dari Syarat untuk Memperoleh Gelar Doktor Pendidikan Ilmu Pengetahuan Alam

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FAKULTAS PENDIDIKAN MATEMATIKA DAN ILMU PENGETAHUAN ALAM
UNIVERSITAS PENDIDIKAN INDONESIA
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PERKULIAHAN FISIKA DASAR DENGAN MODEL *ELICITING ACTIVITIES* BERBANTUAN MULTI REPRESENTASI UNTUK MENINGKATKAN KELANCARAN REPRESENTASI DAN KEMAMPUAN KOGNITIF MAHASISWA PROGRAM SARJANA TEKNIK ELEKTRO

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PERNYATAAN KEASLIAN DISERTASI

Dengan ini saya menyatakan bahwa disertasi dengan judul **"Perkuliahan Fisika Dasar Dengan Model *Eliciting Activities* Berbantuan Multi Representasi untuk Meningkatkan Kelancaran Representasi dan Kemampuan Kognitif Mahasiswa Program Sarjana Teknik Elektro"** beserta seluruh isinya adalah benar-benar karya saya sendiri. Saya tidak melakukan penjiplakan atau pengutipan dengan cara-cara yang tidak sesuai dengan etika keilmuan yang berlaku dalam masyarakat keilmuan. Atas pernyataan ini, saya siap menanggung risiko/sanksi yang dijatuhkan kepada saya apabila kemudian ditemukan adanya pelanggaran terhadap etika keilmuan dalam karya saya ini, atau ada klaim dari pihak lain terhadap keaslian karya saya ini.

Bandung, Maret 2023

Yang Membuat Pernyataan

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Perkuliahan Fisika Dasar dengan Model *Eliciting Activities* Berbantuan Multi Representasi untuk Meningkatkan Kelancaran Representasi dan Kemampuan Kognitif Mahasiswa Program Sarjana Teknik Elektro

ABSTRAK

Penelitian ini bertujuan untuk mengembangkan perkuliahan yang dapat meningkatkan kelancaran representasi dan kemampuan kognitif mata kuliah Fisika Dasar. Penelitian ini merupakan penelitian pengembangan dengan *design and development research* (DDR) tipe 2. Perkuliahan yang dikembangkan disebut model *eliciting activities* berbantuan multi representasi (MEAsBMR). Subjek penelitian terdiri dari 46 mahasiswa program studi Teknik Elektro pada salah satu Perguruan Tinggi Swasta di Lampung. Instrumen penelitian terdiri dari tes kelancaran representasi dan tes kemampuan kognitif, lembar wawancara pada mahasiswa, lembar observasi kegiatan dosen dan mahasiswa, lembar penilaian presentasi, lembar penilaian laporan individu, skala sikap mahasiswa tentang penerapan perkuliahan MEAsBMR. Karakteristik MEAsBMR didasari dari teori Brunner dan konstruktivisme, menggunakan kerangka kerja *the Lesh translation model* (LTM). Fokus penelitian memunculkan aktivitas yang melibatkan simulasi pemecahan masalah kehidupan nyata yang dilakukan secara individu dan kelompok, membekalkan kelancaran representasi dan kemampuan kognitif. Hasil penelitian menunjukkan bahwa perkuliahan MEAsBMR dapat meningkatkan kelancaran representasi dan kemampuan kognitif dalam kategori sedang, yang ditunjukkan dari gain ternormalisasi serta korelasi yang kuat antara kelancaran representasi dengan kemampuan kognitif.

Kata Kunci: model *eliciting activities* berbantuan multi representasi, kelancaran representasi, kemampuan kognitif

Fundamental Physics Lecture with Eliciting Activities Model Assisted Multi-Representation to Improve Representational Fluency and Cognitive Ability In Electrical Engineering Graduate Program

ABSTRACT

This research aims to develop lecture that can improve the representational fluency and cognitive ability Fundamental Physics lecture. This research is a development research with design and development research (DDR) type 2. The lecture developed is called eliciting activities model assisted multi representation (MEAsBMR). The subjects of this research consist of 46 students of the electrical engineering study program at a private university in Lampung. Instruments in this research consist of representational fluency tests and cognitive ability tests, student interview sheets, observation sheets of lecturer and student activities, presentation assessment sheets, individual report assessment sheets, student attitude scale about the implementation of the MEAsBMR lecture program. The characteristics of MEAsBMR are based on Brunner's theory and constructivism, using the Lesh Translation Model (LTM) framework, the focus of the research is to bring up activities that involve simulating real-life problem solving carried out individually and in groups, providing representational fluency and cognitive ability. The results showed that MEAsBMR program can improve the representational fluency and cognitive ability in the medium category, which is shown from the normalized gain and shows a strong correlation between representational fluency and cognitive ability.

Keyword: eliciting activities model assisted multi-representation, representational fluency, cognitive ability

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