MODEL ECIRR BERBANTUAN *INTERACTIVE REFUTATION-TEXTS* (I-ReT) UNTUK MENGUBAH KONSEPSI DAN MEREDUKSI MISKONSEPSI PADA GELOMBANG TRANSVERSAL

TESIS

diajukan untuk memenuhi sebagian syarat untuk memperoleh gelar Magister Pendidikan Fisika

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Sebuah tesis yang diajukan untuk memenuhi salah satu syarat memperoleh gelar Magister Pendidikan Fisika

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PERNYATAAN

Dengan ini saya menyatakan bahwa tesis dengan judul "Model ECIRR berbantuan *Interactive Refutation-texts* (I-ReT) untuk Mengubah Konsepsi dan Mereduksi Miskonsepsi pada Gelombang Transversal" ini beserta seluruh isinya adalah benar-benar karya saya sendiri. Saya tidak melakukan penjiplakan atau pengutipan dengan cara yang tidak sesuai dengan etika ilmu yang berlaku dalam masyarakat keilmuan. Atas pernyataan ini, saya siap menanggung resiko/sanksi apabila dikemudian hari ditemukan adanya pelanggaran etika keilmuan atau ada klaim dari pihak lain terhadap keaslian karya saya ini.

Bandung, 30 Agustus 2022

Yang menyatakan,

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MODEL MODEL ECIRR BERBANTUAN *INTERACTIVE REFUTATION-TEXTS* (I-ReT) UNTUK MENGUBAH KONSEPSI DAN MEREDUKSI MISKONSEPSI PADA GELOMBANG TRANSVERSAL

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ABSTRAK

Model ECIRR berbantaun *Interactive Refutation-texts* (I-ReT) merupakan implementasi model ECIRR yang ditunjang dengan bahan ajar I-ReT. Bahan ajar I-ReT di dalamnya diintegrasikan model ECIRR. Tujuan dari penelitian ini adalah mengubah konsepsi dan mereduksi miskonsepsi peserta didik pada materi gelombang transversal. Penelitian dilakukan menggunakan metode *mixed methods*, dengan desain penelitian *embedded mixed methods*. Sampel pada penelitian ini adalah 35 peserta didik (14 laki-laki dan 21 perempuan, pada rentang usia 16-18 tahun) kelas XI dari salah satu Sekolah Menengah Atas di Kabupaten Tuban, Jawa Timur. Instrumen yang digunakan pada penelitian berupa tes diagnostik dengan format *four-tier* yang digunakan untuk mengukur konsepsi peserta didik, lembar angket respon, lembar observasi keterlaksanaan pembelajaran, serta lembar validasi I-ReT dan LKPD. Sebaran konsepsi peserta didik dianalisis menggunakan *wright map* dan persentase. Kuantitas pengubahan konsepsi peserta didik dianalisis menggunakan persentase dan menggunakan N-*Change*. Kualitas pengubahan konsepsi dianalisis secara kualitatif dengan mendeskripsikan proses pengubahan konsepsi untuk setiap sub-materi. Reduksi miskonsepsi dianalisis menggunakan persamaan RM dan deskripsi proses reduksi miskonsepsi. Hasil penelitian ini disimpulkan bahwa I-ReT berkarakteristik dalam mengubah konsepsi dan mereduksi miskonsepsi, dengan memuat struktur ECIRR, sajian multirepresentasi, simulasi, teks sanggahan, dan penjelasan ilmiah. Kuantitas pengubahan konsepsi berdasarkan nilai N-*Change* secara keseluruhan sebesar 0,69, diinterpretasikan pengubahan yang sedang. Kuantitas perubahan persentase konsepsi untuk materi gelombang transversal secara keseluruhan bertipe *Positive Change* (PoC). Kategori pengubahan konsepsi secara keseluruhan yaitu *Acceptable Change* (ACh) 58%, *Not Accaptable* (NA) 15%, *No Change* (+) 11%, dan *No Change* (-) 12%. Sebagain besar kualitas pengubahan konsepsi berkategori ACh. Reduksi miskonsepsi sebesar 0.86 dan setiap sub-materi mengalami penurunan miskonsepsi dengan kategori tinggi. Peranan I-ReT dalam mengubah konsepsi berkategori sedang dan tinggi, sedangkan mereduksi miskonsepsi berkategori tinggi. Peserta didik menunjukkan respons yang positif. Hasil penelitian ini dapat disimpulkan bahwa peranan *Interactive Refutation-texts* (I-ReT) dalam implementasi model ECIRR dapat mengubah konsepsi dan mereduksi miskonsepsi peserta didik pada materi gelombang transversal.

Kata kunci: Model ECIRR, *Conceptual Change*, Pengubahan Konsepsi, Miskonsepsi, *Interactive Refutation-Texts* (I-ReT), *Embedded Mixed Methods*, *Four-Tier*, Gelombang Transversal

ECIRR MODEL ASSISTED INTERACTIVE REFUTATION-TEXTS (I-ReT) TO CHANGE CONCEPTION AND REDUCE MISCONCEPTIONS IN TRANSVERSE WAVES

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ABSTRACT

The ECIRR model assisted by Interactive Refutation-texts (I-ReT) is an implementation of the ECIRR model supported by I-ReT teaching materials. The I-ReT teaching materials are integrated with the ECIRR model. The purpose of this research is to change the conception and reduce students' misconceptions about the material of transverse waves. The research was conducted using mixed methods, with embedded mixed methods research design. The sample in this study was 35 students (14 boys and 21 girls, aged 16-18 years) in class XI from one of the senior high schools in Tuban Regency, East Java. The instruments used in the study were diagnostic tests with a four-tier format used to measure students' conceptions, response questionnaire sheets, learning implementation observation sheets, and I-ReT and LKPD validation sheets. The distribution of students' conceptions was analyzed using the Wright map and percentages. The quantity of change in students' conceptions was analyzed using percentages and using N-Change. The quality of changing the conception was analyzed qualitatively by describing the process of changing the conception for each sub-material. The reduction of misconceptions was analyzed using the RM equation and a description of the process of reducing misconceptions. The results of this study concluded that I-ReT has the characteristics of changing conceptions and reducing misconceptions, by containing the ECIRR structure, multi-representation presentations, simulations, rebuttal texts, and scientific explanations. The quantity of conversion of conception based on the overall N-Change value is 0.69, which is interpreted as a moderate change. The quantity of change in the percentage of conception for the transverse wave material as a whole is of the Positive Change (PoC) type. The overall concept change category is Acceptable Change (ACh) 58%, Not Acceptable (NA) 15%, No Change (+) 11%, and No Change (-) 12%. Most of the quality of changing the concept of the ACh category. The reduction of misconceptions was 0.86 and each sub-material experienced a decrease in misconceptions in the high category. The role of I-ReT in changing conceptions in the medium and high categories, while reducing misconceptions in the high categories. Students show positive responses. The results of this study can be concluded that the role of Interactive Refutation-texts (I-ReT) in the implementation of the ECIRR model can change the conception and reduce students' misconceptions about the material of transverse waves.

Keywords: ECIRR Model, Conceptual Change, Misconception, Interactive Refutation-Texts (I-ReT), Embedded Mixed Methods, Four-Tier, Transverse Wave.

KATA PENGANTAR

Puji dan syukur penulis panjatkan kehadirat Allah SWT yang mana atas berkat rahmat-Nya penulis dapat menyelesaikan tesis dengan judul "Model ECIRR berbantuan *Interactive Refutation-texts* (I-ReT) untuk Mengubah Konsepsi dan Mereduksi Miskonsepsi pada Gelombang Transversal".

Tesis ini disusun untuk memenuhi sebagian dari syarat memperoleh gelar Magister Pendidikan di Program Studi Pendidikan Fisika. Tujuan dari penelitian ini adalah memperoleh gambaran implementasi model ECIRR berbantuan *Interactive Refutation-texts* (I-ReT) dalam mengubah konsepsi dan mereduksi miskonsepsi pada materi gelombang transversal yang lebih positif melalui pembelajaran.

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