# PENGEMBANGAN *REFUTATIONAL TEXTS* BERBANTUAN *AUGMENTED REALITY* (RefTaR) UNTUK MENGUBAH KONSEPSI DAN MODEL MENTAL PADA MATERI LISTRIK STATIS

TESIS

diajukan untuk memenuhi sebagian syarat memperoleh gelar Magister
Program Pendidikan Studi Ilmu Pengetahuan Alam

Oleh:
Mohd Zaidi Bin Amiruddin
NIM 2310958

PROGRAM MAGISTER PENDIDIKAN ILMU PENGETAHUAN ALAM
FAKULTAS PENDIDIKAN MATEMATIKA DAN ILMU PENGETAHUAN ALAM
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PENGEMBANGAN *REFUTATIONAL TEXTS* BERBANTUAN *AUGMENTED REALITY* (RefTaR) UNTUK MENGUBAH KONSEPSI DAN MODEL MENTAL PADA MATERI LISTRIK STATIS

Oleh
Mohd Zaidi Bin Amiruddin
S.Pd. Universitas Negeri Surabaya 2023

Sebuah tesis yang diajukan untuk memenuhi salah satu syarat memperoleh gelar Magister (M.Pd.) pada Fakultas Pendidikan Matematika dan IPA

**HALAMAN PENGESAHAN TESIS**

MOHD ZAIDI BIN AMIRUDDIN

PENGEMBANGAN *REFUTATIONAL TEXTS* BERBANTUAN *AUGMENTED REALITY* (RefTaR) UNTUK MENGUBAH KONSEPSI DAN MODEL MENTAL PADA MATERI LISTRIK STATIS

**Disetujui Oleh:**

| Pembimbing I | Pembimbing II |
|---|---|
| **Dr. Achmad Samsudin, M.Pd.** | **Prof. Dr. Andi Suhandi, M.Si.** |
| **NIP. 198310072008120104** | **NIP. 196908171994031003** |

| Penguji I | Penguji II |
|---|---|
| **Prof. Dr. Ida Kaniawati, M.Si.** | **Dr. Eka Cahya Prima, M.T.** |
| **NIP. 196807031992032001** | **NIP. 199006262014041001** |

Mengetahui,

Ketua Program Studi Pendidikan Ilmu Pengetahuan Alam FPMIPA UPI

**Prof. Dr. Phil. Ari Widodo, M.Ed.**
**NIP. 196705271992031001**

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Bandung, 23 Januari 2025

Penulis

Mohd Zaidi Bin Amiruddin

NIM.2301958

PENGEMBANGAN *REFUTATIONAL TEXTS* BERBANTUAN *AUGMENTED REALITY* (RefTaR) UNTUK MENGUBAH KONSEPSI DAN MODEL MENTAL PADA MATERI LISTRIK STATIS

Mohd Zaidi Bin Amiruddin
2310958

Pembimbing I: Dr. Achmad Samsudin, M.Pd.
Pembimbing II: Prof. Dr. Andi Suhandi, M.Si.
Prodi Magister Pendidikan IPA FPMIPA UPI

## ABSTRAK

Penelitian ini bertujuan menghasilkan produk *Refutational Texts* berbantuan *Augmented Reality* (RefTaR) yang valid dan teruji untuk mengubah konsepsi dan model mental peserta didik SMA pada materi listrik statis. *Educational Design Research* digunakan sebagai metode penelitian yang mengacu pada model pengembangan ADDIE. Analisis kebutuhan pengembangan RefTaR dilakukan dengan meninjau artikel dan studi lapangan. Desain pengembangan dilakukan dengan membuat rancangan bahan belajar RefTaR, Aplikasi RefTaR, dan visualisasi AR dan video 3D. Pengembangan dilakukan sesuai dengan hasil rancangan yang telah dibuat dan kemudian dilakukan validasi oleh ahli untuk melihat kelayakan RefTaR. *Pretest-posttest randomized experimental design* dilakukan untuk memilih kelas eksperimen dan kontrol. Pemetaan konsepsi dan model mental peserta didik masing-masing menggunakan instrumen *four-tier conception test* dan instrumen *level of understanding*. Implementasi dilakukan dengan *purposive sampling* pada peserta didik yang mengalami miskonsepsi dan model mental *initial-synthetic* pada tahap *pretest*. Pada kelas eksperimen menggunakan RefTaR dan pada kelas kontrol menggunakan *Refutational Texts*. Hasil penelitian ini menunjukkan bahwa RefTaR (kelas eksperimen) memberikan dampak lebih baik ditinjau dari efektivitas dibandingkan *Refutational Texts* (kelas kontrol) dalam pengubahan konsepsi dan model mental peserta didik pada konsep listrik statis. Hal ini menunjukkan bahwa bahan belajar RefTaR memiliki potensi besar dalam membantu peserta didik untuk mengubah konsepsi dan model mental.

**Kata kunci:** *Augmented Reality*, Pengubahan Konsepsi, Listrik statis, Model mental, RefTaR

DEVELOPMENT OF *AUGMENTED REALITY*-ASSISTED *REFUTATIONAL TEXTS* (RefTaR) TO CHANGING CONCEPTS AND MENTAL MODELS ON STATIC ELECTRICITY MATERIALS

Mohd Zaidi Bin Amiruddin

2310958

1st Supervisor: Dr. Achmad Samsudin, M.Pd.

2nd Supervisor: Prof. Dr. Andi Suhandi, M.Si.

Magister of Science Education Study Program FPMIPA UPI

## ABSTRACT

This study aimed to produce Refutational Texts assisted by Augmented Reality (RefTaR) products that are valid and tested to change the conceptions and mental models of high school students on static electricity material. Educational Design Research is used as a research method that refers to the ADDIE development model. The analysis of RefTaR development needs was carried out by reviewing articles and field studies. The development design was carried out by designing RefTaR learning materials, RefTaR applications, and AR visualizations and 3D videos. Development was carried out in accordance with the results of the design that had been made and then validated by experts to see the feasibility of RefTaR. Pretest-posttest randomized experimental design was conducted to select experimental and control classes. The mapping of conceptions and mental models of students respectively used a four-tier conception test instrument and a level of understanding instrument. Implementation was carried out by purposive sampling on students who experienced misconceptions and initial-synthetic mental models at the pretest stage. The experimental class used RefTaR and the control class used Refutational Texts. The results of this study indicate that RefTaR (experimental class) has a better impact in terms of effectiveness than Refutational Texts (control class) in changing students' conceptions and mental models on the concept of static electricity. This shows that RefTaR learning materials have great potential in helping students to change conceptions and mental models.

**Keywords:** Augmented Reality, Alteration Conception, Model Mental, RefTaR, Static electricity

## PERNYATAAN BEBAS PLAGIARISME

Saya yang bertanda tangan di bawah ini:

| | |
|---|---|
| Nama | : Mohd Zaidi Bin Amiruddin |
| NIM | : 2310958 |
| Program Studi | : S2-Pendidikan IPA |
| Judul Karya | : Pengembangan *Refutational Texts* Berbantuan *Augmented Reality* (RefTaR) untuk Mengubah Konsepsi dan Model Mental Pada Materi Listrik Statis |

Dengan ini menyatakan bahwa karya tulis ini merupakan hasil kerja saya sendiri. Saya menjamin bahwa seluruh isi karya ini, baik sebagian maupun keseluruhan, bukan merupakan plagiarisme dari karya orang lain, kecuali pada bagian yang telah dinyatakan dan disebutkan sumbernya dengan jelas.

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Bandung, 23 Januari 2025
Yang menyatakan,

Mohd Zaidi Bin Amiruddin
NIM.2301958

## DAFTAR ISI

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# DAFTAR PUSTAKA


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