

# AUGMENTED REALITY-BASED EDUCATIONAL GAMES FOR MILD DYSLEXIC CHILDREN



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## Offering Letter



MINISTRY OF EDUCATION, CULTURE, RESEARCH, AND  
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Malang, 27 September 2021

Dear.

Head of agency / company  
in place

Yours faithfully,

Our organization RNF Group is dedicated and experienced in providing augmented reality-based application design services, website applications and android-based applications.

Through this offer letter, we offer a proposal for making "Augmented Reality-Based Educational Games for Mild Dyslexic Children" for dyslexic children in the Malang city area, especially those under the agency/institution you are leading. The proposals for making applications that we offer have been attached together with this letter.

We thank you for your attention and cooperation.

Malang, 27 September 2021  
Best regards,

Project Manager

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## **Abstract**

Augmented Reality (AR) is a new medium for delivering information that is currently developing. AR is a technology that combines two-dimensional and three-dimensional virtual objects into the real environment around us. Judging from the capabilities possessed by AR, AR can be used as an interesting learning medium for children. This is because AR can provide interactive and more efficient learning, because children not only learn theoretically but also see objects taught in 3D.

In this proposal will be Augmented Reality-Based Educational Games for Mild Dyslexic Children. This application is made using the Vuforia library and Unity Engine. Applications can display 3D objects of fruit and vegetables. In addition, there is audio as an aid so that children can better understand the name of the object in question. Based on the condition of dyslexic children who have delays in learning, the presence of 3D and audio objects can help children in the process of recognizing objects in the surrounding environment,

## **Introduction**

Learning difficulties are conditions where children have IQs above average, but have learning disabilities related to sensory-motor integration. Children with special needs have the right to have a proper education like other children. This education does not include education with the category of extraordinary children but special education for dyslexic children. Children with learning difficulties usually have delays in learning to speak, write, count and spell. The number of children who have learning difficulties continues to increase every year. The government continues to strive to pay special attention to the world of education for children with special needs which is increasing every year. This also affects the development of human resources. Based on the report of the United Nations Program (UNDP) in 2009, Indonesia was ranked 111 out of 182 countries. The current ranking is far below neighboring countries, such as Malaysia (66), Brunei Darussalam (30), or even Singapore (23), (Prasetya and Widiyaningtyas, 2010:2).

Many people think that low reading ability is associated with the number of children who have learning difficulties. A study in DKI Jakarta revealed that out of 3,215 first-grade to sixth-grade elementary school students, 16.52% were declared as having learning difficulties (Mulyono Abdurrahman, 2009:10). The government also continues to strive for the development of education in Indonesia. This is no exception in inclusive education for children with special needs. Through inclusive education, children with special needs need to be given educational eligibility, as well as the same opportunities and opportunities as normal children in general. This means that a child with special needs can be defined as a child who needs an education that is tailored to the learning barriers and needs of each child individually (PP No. 17 of 2010 Article 129: (3)).

In today's technological developments, there are many variations of games, one of which is Augmented Reality (AR). Augmented Reality (AR) is now not only used as entertainment or only used for big companies in helping their performance but also for educational games as a medium for learning for school children. Although there are many decent and quality educational games, there are not a few educational games for children with special needs such as dyslexia.

From the description of the problems that arise due to the lack of learning media for children with mild dyslexia, we created learning media for children with mild dyslexia. Our goal is to help children who are classified as difficult in reading and spelling fluency, it is hoped that children can hone fluency in this game. This game will be a collection of words that will have an audio sound to help spell. This game will be designed to be as attractive as possible so that it can attract the attention of children with mild dyslexia in learning to read and spell words.

## **Purpose**

We target children with special dyslexia at the age of 5-8 years, because this reading and spelling game is an educational game that helps children improve reading and increase vocabulary. We hope that this game will make it easier for them to read and spell words.

## **Benefit**

The benefits obtained are:

1. Children aged 5-8 years are able to learn spelling words well;
2. Utilizing existing technology while making children with mild dyslexia feel that learning is fun;
3. Help relieve friends who work to guide mild dyslexic children.

## **The System Offered**

Here are some explanations about the application of the game:

### **7.1 Mechanics and the Player's Role**

In this game a child is expected to be able to read and spell the available words. The words provided are in the form of daily items such as fruits and vegetables so that children can be familiar with the things around them. The game is equipped with pictures, spelling of the words, and audio. The prepared audio can be played and heard by the players, so it can help the process of understanding and learning words.

### **7.2 Genre**

The genre that we adopt in this game is the educational genre. Where education means education which has the meaning of a process of changing the attitudes and behavior of a person or group of people in an effort to mature humans through teaching and training efforts.

In accordance with the background and target of our players, namely children with mild dyslexia. This game is an effort that we do to make it easier for dyslexic children from the process of recognizing objects through pictures, to the process of speaking. The process of learning to talk, of course, stimulates children to read and recognize letters. If in the game, the child has difficulty reading the words, then the child can play the available audio.

### 7.3 Competition Modes

This reading and spelling game for mild dyslexic children uses single player mode. Where this game is only intended for one player and cannot be played by more than one player at a time. This game only focuses on one child, because we hope that children can play easily, and focus more on the learning process to understand and spell the given word well.

### 7.4 Technology and Resources Used

#### 7.4.1 Unity

The Unity 3D application is a game engine that is an image processing software, graphics, sound and input, and others. Intended for making a game, although not always for games.

Unity is a multi-platform game engine. The platforms used are usually web-based, android, iOS, XBOX. With this, Unity requires a license to be published to certain platforms. but Unity provides it for free users and can be published in the form of Standalone (.exe).

#### 7.4.2 Vuforia

Vuforia Engine is a software development kit (SDK) for creating Augmented Reality apps. Developers can easily add advanced computer vision functionality to any application, allowing it to recognize images and objects, and interact with spaces in the real world.

Vuforia Engine supports AR app development for Android, iOS, Lumin, and UWP devices. See: Vuforia Engine Supported Versions

This Getting Started guide will show you:

- How to add Vuforia Engine to your Unity project
- How to set up Vuforia Engine's features in Unity
- How to add content and test your Unity project

## Schedule

*Table 8. 1 Table Schedule WBS*

Level 1	Level 2	Level 3
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1.0 System Information Archiving Documents for Students of State Polytechnic Malang	1.1 Planning and Requirements	1.1.1 Organise the stakeholder requirements 1.1. 2 Clarify the requirements for implementing the software
	1.2 Design and Architecture	1.2.1 Make sure to define the design of the software 1.2.2 Architecture that we use to make our software
	1.3Development	1.3.1 Develop the information system 1.3.2 Application Development according to Needs Analysis 1.3.3 Application Testing
	1.4 Implementation	1.4.1 Train the user
	1.5 Testing	1.5.1 Perform unit testing, integration testing and acceptance tests
	1.6 Deployment and maintenance	1.6.1 Make the system available and usable 1.6.2 Maintenance

## Organization

*Table 9. 1 Organization and Job Description*

No	Name/ID	Study Program	Knowledge Field	Time (hours/days)	Job Description
1	Nabilah Affryda Rihadatul'aisy / 1841720012	Informatics Technology	Technology	8	Software Developer
2	Revinda Amalia Saktyawati / 1841720185	Informatics Technology	Technology	3	Project Manager
3	Salsabila Firdausy / 1841720036	Informatics Technology	Technology	8	Software Developer

## Portfolio



### WORK AUGMENTATION FOR THE DIGITAL INDUSTRIES WORKFORCE

Empower your Workforce with  
Augmented Reality Guidance and Remote Collaboration

PORTFOLIO



*Picture 10. 1 Portfolio*

## OUR PROJECT

### T-Maps



We show how a system for video-rate parallel camera tracking and 3D map-building can be readily extended to allow one or more cameras to work in several maps, separately or simultaneously.

*Picture 10. 2 Portfolio Projects*

## RAB

*Table 11. 1 RAB*

Budget Plan		Sum	Unit Price (Rp)	Total Price (Rp)
A	Product Development			
	Android Smartphone	1 unit	2.500.000	2.500.000
	Game storyboarding	-	200.000	200.000
	Development in AR Software (salary for 3 staff)	44 days	395.000	17.380.000

B	Consumable			
	Internet data quota	2 month	200.000	400.000
	80gr A4 Paper	1 rim	45.000	45.000
	Printer ink (black)	1	150.000	150.000
	Printer ink (color)	1	200.000	200.000
	Office Supplies	1 set	150.000	150.000
C	Others			
	Proposal Preparation	-	100.000	100.000
	Field observation	-	250.000	250.000
	Field Test	-	300.000	300.000
Total				21.675.000

## Attachment

### 12.1 Mockup



Picture 12. 1 Home



*Picture 12. 2 Game 1*



*Picture 12. 3 Game 2*

## 12.2 Client List

Sebaya Squad at Malang and Sidoarjo. They care about dyslexia, ADHD (attention deficit Hyperactivity Disorder), friendly assessment, parent support group and supporting fun learning.

## 12.3 CV

### 12.3.1 Nabilah Affryda Rihadatul'aisy



**CONTACT ME AT**

-  Malang, East Java
-  081252490648
-  nabilahaffryda88@gmail.com
-  <https://github.com/nabilahaffryda>
-  [linkedin.com/in/nabilahaffryda](https://www.linkedin.com/in/nabilahaffryda)

**SKILLS SUMMARY**

- Laravel Framework
- SQL
- ReactJS
- PHP
- VueJS
- Javascript
- Code Igniter
- HTML/CSS/Bootstrap
- Copywriter
- Content Writer
- Article Writer
- Microsoft Office Package

**AWARDS RECEIVED**

-  Best Talent of English Speech Competition (2016)

**LANGUAGES**

- English
- Indonesian

## NABILAH AFFRYDA R

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### JUNIOR WEB DEVELOPER

#### PERSONAL PROFILE

Creative and motivated IT student with experiences as junior frontend web developer. I also have skills and experience in copywriting and make article content. Enjoy working in a team and have good communication skills.

#### WORK EXPERIENCE

##### Frontend Web Developer

Jalin Mayantara Indonesia, PT | June 2021 - August 2021

- Internship as a web developer and focus on working on the frontend.
- Design and develop survey manager website

##### Edutainment Program

UTeM (Universiti Teknikal Malaysia Melaka) | August 2019

- Participate in Malaysian cultural introduction and learning programs

##### Content Writer

Dailisya | 2019

- Working on biographical articles for Korean artists

##### Freelance Writer

Freelancer | 2018 - now

- Do various types of sales copywriting for multiple websites.

#### EDUCATIONAL HISTORY

##### Senior High School 2 Malang

Mathematic and Science | 2015 - 2018

- Participate in English speech and debate competitions at the school and university level.

##### State Polytechnic of Malang

Diploma 4 Informatics Engineering | 2019 - 2022

- Finalist of E-Government KMIPN 2019
- Volunteer Edutainment Program 2019 in Malaysia
- Member of the WRI (Workshop & Informatics Research) community



### 12.3.2 Revinda Amalia Saktyawati



#### OBJECTIVE

I am a very extrovert person who likes to connect with people. I am a natural multitasker and does not rest until a task is complete and satisfactory.

#### CONTACT INFORMATION

✉ revindaamalia@gmail.com

☎ 081232781401

📍 Malang, Jawa Timur

🌐 Revinda Amalia Saktyawati

#### SKILLS

- Creative
- Communication
- Multitasking
- Negotiation
- Working under pressure
- Time management
- Microsoft package
- Good writing skills
- Project management

#### EDUCATION

**State Polytechnic of Malang**  
2018 - Now | Information Technology

**Senior High School 4 Malang**  
2015-2018

## REVINDA AMALIA SAKTYAWATI

#### AWARD

- 2019 **KMIPN 2019**  
Finalis Bussiness Plan Competition 2019
  - Creating business ideas that can be developed into startups.
- 2019 **Entrepreneur Bisnis Festival Vol.4**  
Finalis Bussiness Plan Competition
  - Creating business ideas that can be developed into startups.
- 2019 **Digital Talent Scholarship**  
Kominfo Jawa Timur
  - To be an example to create 1000 startups in Indonesia.

#### EXPERIENCE

- 2020 **FREELANCE BUNG.KOS**  
FIELD COORDINATOR
  - Work in Sunday.
  - Coordination team to achieve targets in serving customers who need services, like cleaning the room, sending package of customer accoring to the agreement of team and customers.
- 2020 **Digital Marketing Certificate Course**  
Google Digital Garage
  - Final output received a grade of 90%.
- 2020 **Elements of AI Certificate Course**  
University of Helsinki
  - Final output received a grade of 65%.

### 12.3.3 Salsabila Firdausy



## Salsabila Firdausy

### Personal Profile

A highly motivated student looking for new experiences while continuing education. I have a positive mind and ability to adapt and create a stable environment around me. Throughout my education, I have demonstrated work ethic and teamwork to achieve my predicted grades. I am looking forward to utilizing this skill and grow professionally in a new field

### Get in touch!

**Mobile:**  
082334249009

**Email:**  
salsa.firdausy@gmail.com

**Address:**  
Malang, Jawa Timur

### Experience

**Member of LPM Kompen (campus press)**  
**One Periode | 2018 - early 2020**

- Magazine editorial staff who deals with planning magazine publishing
- Collaborate with other divisions for the success of all organizational activities

**Magazine Managing Editor**  
**LPM Kompen Magazine Edition XXVI | 2019**

- Managing all parts of the division in the magazine creation process
- Cooperate with the magazine launch event team

**Edutainment Program**  
**Universiti Teknikal Malaysia Melaka | 2019**

- Education and entertainment summer camp program from 18 - 25 August 2019 in UTeM Melaka, Malaysia

### Academic History

**State Polytechnic of Malang**  
**Informatics Engineering Study Program**

- Enrolled since 2018 to present

**Islamic Boarding Senior High School of Sabilillah Malang**  
**Major in Science Class**

- Enrolled since 2015 to 2018

### Skill and Abilities

- Creative
- Multitasking
- Time Management
- Organizational Skills
- Presentation Skills
- Microsoft Package
- Corel Draw
- HTML and CSS