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Booklets

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Title: Augmented Reality in Education: Transforming Learning through Technology

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Introduction

In the digital era, the incorporation of emerging technologies has revolutionized multiple aspects of learning, and Augmented Reality (AR) is one of the most promising tools in this field. **AR allows the overlay of digital information, such as images, sounds, or texts, onto the physical environment** through devices like smartphones, tablets, and smart glasses. Unlike Virtual Reality (VR), which creates a fully immersive digital environment, AR enriches the real world, providing an interactive, multisensory experience that enhances the learning process.

Introduction

Learning the English language presents significant challenges when traditional methodologies are used. Lectures and textbooks often fail to capture students' attention or promote information retention, limiting their motivation and understanding of key concepts. The integration of AR in English language education has the potential to transform these challenges into more engaging and effective learning opportunities.

This project focuses on creating an interactive resource for teaching English through the combination of Unity and Vuforia platforms. Unity, known as a game development engine, is also widely used to create interactive AR applications, while Vuforia facilitates the recognition of images and objects to overlay digital content in real-time..

Introduction

By integrating these tools, this project aims to develop an interactive educational book that motivates students and provides them with an enriched and personalized learning experience. This innovative approach seeks not only to teach English effectively but also to foster greater motivation and engagement in the learning process.

Methodology

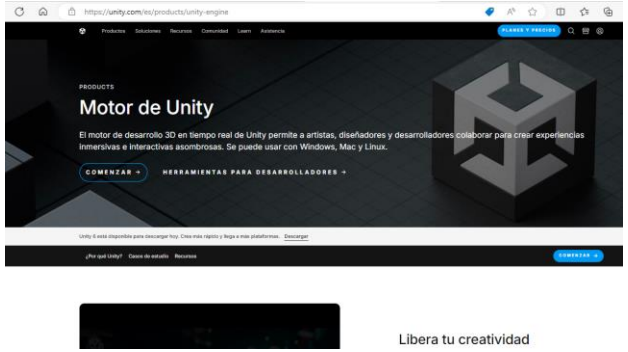
The project emerged after an exhaustive review of the literature on Augmented Reality (AR) and a technical study of the Unity and Vuforia platforms. With the acquired theoretical and technical understanding, we moved to the practical phase, which included installing the necessary programs to develop an application. Over several sessions, an interactive APK was designed in Unity, integrating an educational book with AR to support English language teaching.

For the development of the English learning application, we used the following tools:
Unity: The primary development engine, chosen for its ability to create interactive 3D environments and its compatibility with Augmented Reality (IMAGE 1).
Vuforia: Selected to implement Augmented Reality, known for its strength in real-time image and object recognition, allowing digital content overlay (IMAGE 2).
Laptop: The device used throughout the development process (IMAGE 3)

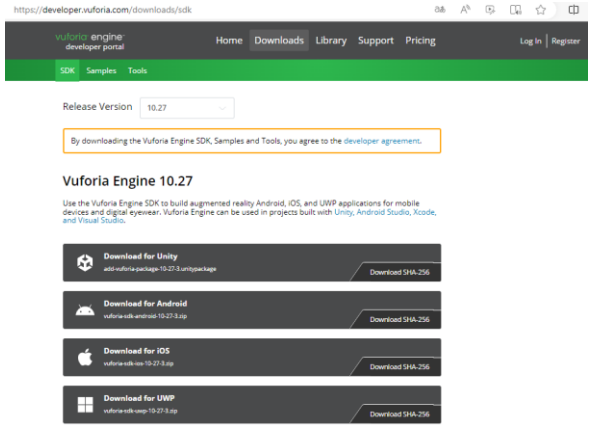
Methodology

To develop the English learning application, we used the following tools:

Unity: The primary development engine, chosen for its ability to create interactive 3D environments and its compatibility with Augmented Reality (IMAGE 1).



Vuforia: Selected for implementing Augmented Reality, noted for its real-time image and object recognition capabilities to overlay digital content (IMAGE 2).



Laptop: The device used throughout the development

Methodology

Installation and Configuration Environment

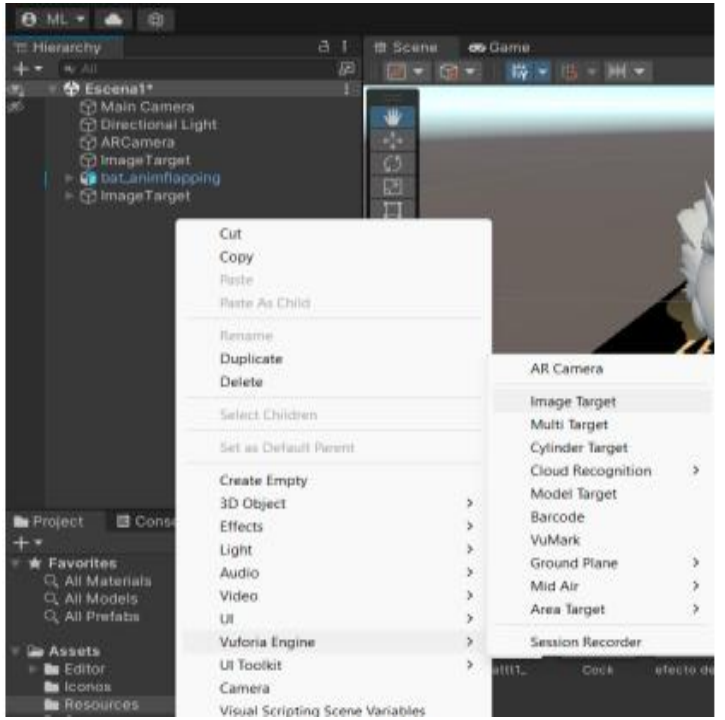
The benefits of the book are aimed at improving language skills in children. This immersive technology enables interaction with virtual elements in the real environment, providing solutions such as:

1. Enhancement of language skills through interaction in English.
2. Increased knowledge retention due to its practical and contextual approach.
3. Greater motivation for learning through a playful methodology.
4. Personalized adaptation to individual levels and pace.
5. Promotion of independent practice at any time and place.
6. Building confidence in using the language in a safe manner.
7. Adaptability to different learning styles with a multisensory experience.
8. Progress evaluation for specific feedback.
9. Simulation of everyday scenarios in English to prepare for real-life situations.

Methodology

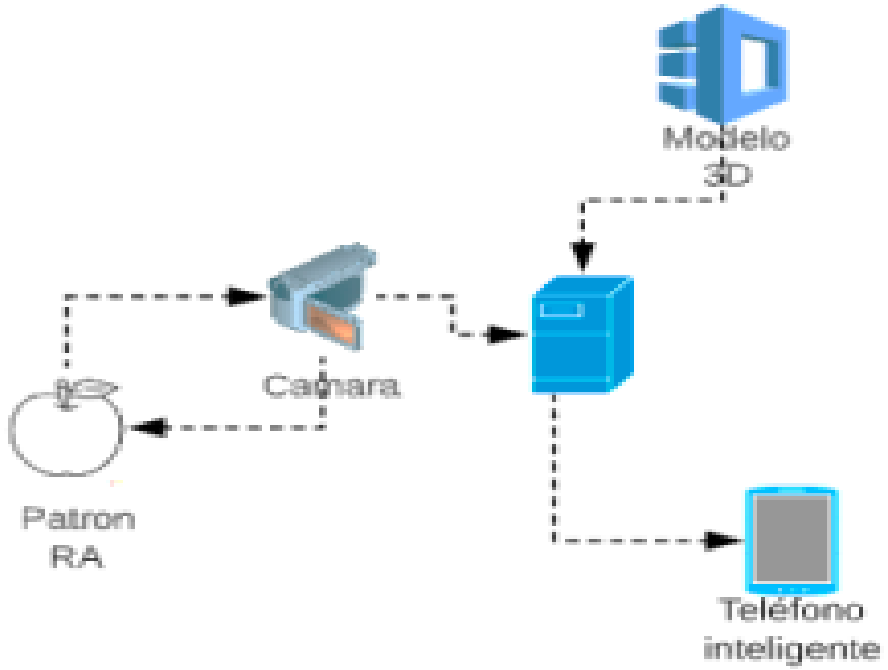
For this purpose, the creation of images to support the booklet is implemented.

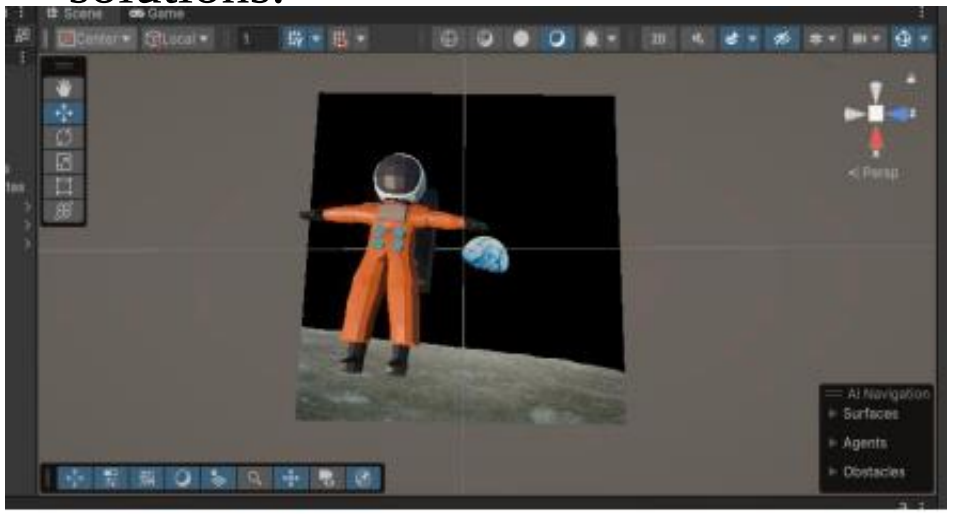
Image Target Creation
To create image targets, the Vuforia tool is required, which is compatible with 3D models and facilitates t heir integration into augmented reality.



Methodology

Construction process from an Augmented Reality pattern, through the camera and 3D modeling with a smartphone. Implementing different image targets and adding audio to them enables the deployment of various solutions.





Methodology

Parameter	Impact Level (%)	Source
Increase in Knowledge Retention	80%	Journal of Educational Technology
Learning Personalization	85%	Educational Research Review
Facilitation of Independent Practice	4.5/5	Computers & Education Journal
Boost in Confidence with Language Use	70%	Language Learning & Technology
Adaptability to Different Learning Styles	4.8/5	British Journal of Educational Technology
Individual Progress Evaluation	78%	Educational Assessment Journal
Preparation for Real-Life Situations	82%	Journal of Interactive Learning
Inclusive Access through the Application	90%	Accessibility in Education Report

Results

The development of the interactive book based on Augmented Reality (AR), using Vuforia and Unity, created an innovative educational tool that optimized the English teaching process, as shown in the image.

As a result, a semi-functional installable APK was developed, starting with a loading screen and then displaying the main menu. Within this menu, there are learning options that operate through image targets from the Vuforia package for AR integration. The implementation of a login system to store user progress remains pending.

Results


Conocenos
JUEGA INGLES
Test Inicial
Preposiciones
Animales
Pronombres
Colores
Evaluacion final
Salir


Part 1
Look and read. Put a (✓) or a cross (✗) in the box. And repeat the sound.
There are three examples:
Examples:
This is a bear
This is a cat
This is a dog
This is a camel

Results

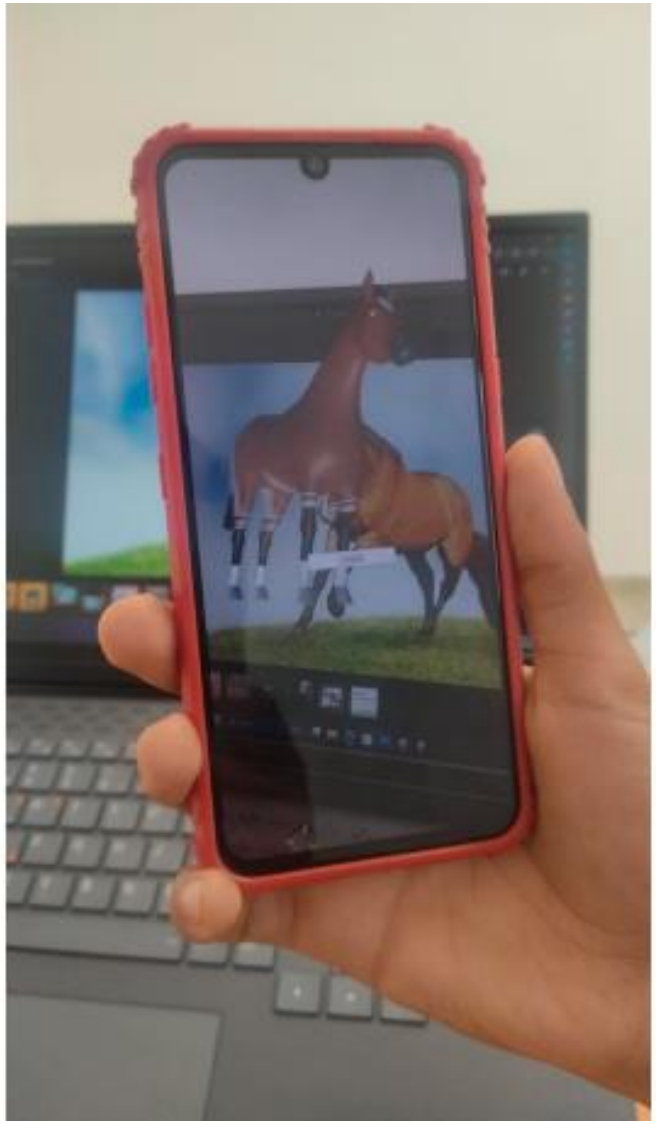
Providing improvements in:

Increased Motivation: Students who used the interactive AR book showed greater engagement than with traditional methods, thanks to multisensory interaction with 3D content and animations.

Greater Information Retention: Students who used the AR book retained more knowledge due to the use of 3D models and sound, compared to conventional texts.

Accessibility and Simplicity: The AR application is compatible with common mobile devices, making it easy to use in the classroom and intuitive for both students and teachers.

Positive Evaluation from Teachers: Educators appreciated AR for its ability to personalize and adapt content to various learning levels.



Results

Acknowledgments

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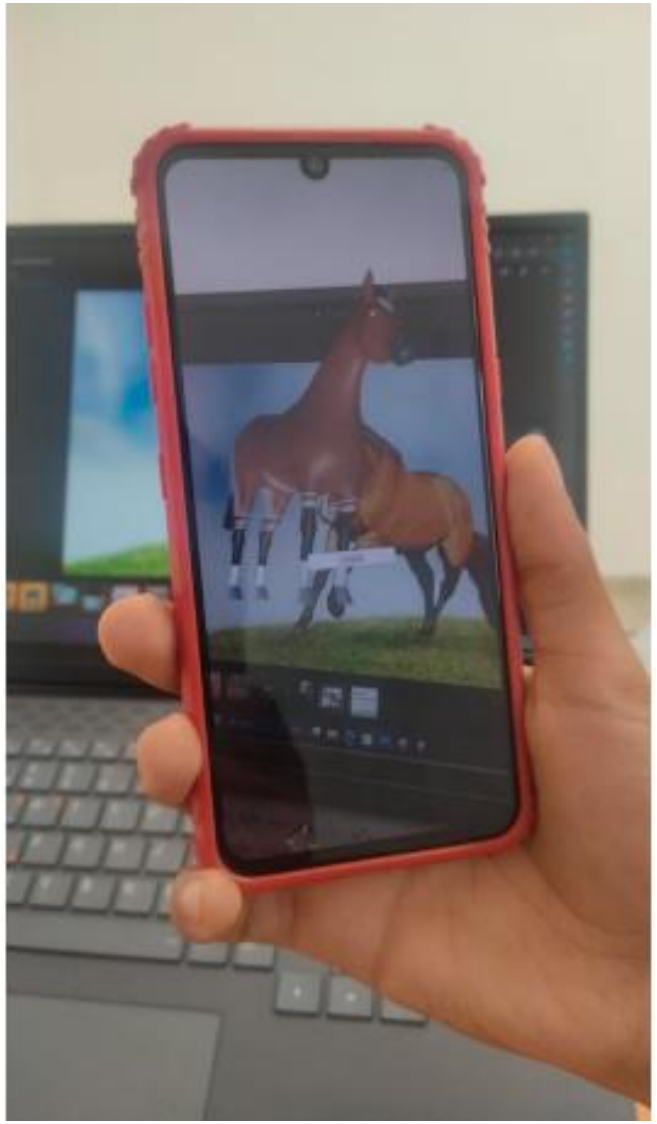

Conclusions

This study reveals that Augmented Reality (AR) holds considerable potential to enhance English language teaching, offering an innovative pedagogical tool that enriches both the educational experience and learning outcomes. The combination of the Vuforia and Unity platforms in the development of an interactive book has enabled not only the presentation of content in a dynamic and visually engaging manner but also the stimulation of greater motivation and information retention among students. By providing a multisensory and immersive learning experience, AR transforms a traditionally passive learning process into a more interactive one, meeting the current educational needs in the digital context.

Despite the demonstrated benefits, certain significant challenges have been identified for the implementation of this technology. These include technological accessibility, which requires compatible devices and adequate resources, and teacher training, as educators must be prepared to integrate and facilitate the technology in the classroom. These factors underscore the importance of developing teacher training programs and accessibility strategies to

Conclusions

With proper integration and a strong pedagogical approach, Augmented Reality (AR) has the potential to serve as a transformative tool in language education and other fields. This project not only demonstrates the immediate benefits of AR but also lays a solid foundation for future research into the use of advanced technologies in education. AR can not only enhance learning and student motivation in school environments but also open new possibilities for personalized learning, adapting to different learning styles and paces.

In conclusion, the results of this study suggest that Augmented Reality represents a valuable innovation in education and can play a crucial role in the evolution of teaching methodologies, benefiting a wide range of institutions and educational contexts.

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