Multimodal Learning Augmented Reality Application for Kids

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ABSTRACT

Augmented Reality interactions add inventiveness, accessibility, and engagement, to the process of learning with the integration of multimodality. Apart from visualization and annotation, storytelling is also one thing that Augmented Reality does really well. As the adoption of new digital technologies has been rising across the world, and as the new age kids, are growing up surrounded by technology, having been exposed to so many devices from early-on, cross-reality technologies seem extremely promising as they would be the technologies of the future.

This project proposes an Augmented Reality App, that aims to enhance the early childhood education and development by the use of multiple ways of interacting with study materials. The main objective of this application is to (1) improve interactivity in learning by combining the physical and the virtual, and (2) offer multiple ways of engaging with learning material to spark creativity.

KEYWORDS

Augmented Reality, Multimodality, Early Childhood Education

1 INTRODUCTION

The added element of inventiveness and interactivity to the learning process is highly beneficial, especially for early-learners, as assimilation of important concepts and understanding of the fundementals are facilitated. In this project, we aspire to add dimensionality to learning and understanding ideas to make learning a joyful experience that is part of a kid's daily life.

One of the ideas we propose is for children to use the mobile app in tandem with flash cards onto which virtual graphics can overlay. By adding dimensionality, to the otherwise 2D methods of learning, we plan to encourage children to learn and engage with their study material.

The traditional ways of teaching and classroom idea is rapidly changing, especially post-pandemic, after which there has been an increasing interest in adoption of digital technologies and e-learning methods. The future holds promises of other methods of learning that is not restricted by space, form of study materials, or student interaction. We hope that by the development of this application, we are able to stimulate the imagination and creativity of early learners.

The AR context of learning is also extremely beneficial in enabling freedom in pace of learning. Every early learner picks up concepts in their own way, and should be allowed the amount of time that is just right for their inclinations, capabilities and interests.

Moreover, in the classroom setup, everyone is forced into a common, generic experience and that is often not beneficial in developing a child's natural skills. With the experience of using the AR app, children have more freedom and space for imagination and creativity, as it aids them specifically in the areas of problem-solving and ingenuity.

Having multiple ways of interacting with the learning material is what promises a wholesome experience while offering flexibility and protecting interests of early learners.

2 MOTIVATION

Often times, educators, following traditional methods of imparting education, in group settings, or classroom context, do not have the time to cater to each child's needs, and this can have a detrimental impact on the child's overall development in the early ages. This is because the attention and involvement needed to promote engagement in learning is lacking in such traditional schooling techniques.

Augmented Reality is the right kind of tool to approach such a problem as it acts as an aid to the existing systems of imparting learning. Learning something is a difficult process in itself, and combining that with instruction in a group can be particularly intimidating. Augmented learning methods can be extremely beneficial to those struggling to catch up with the rest of the class. Not only does it promote engagement, but it relaxes and calms a child by making the learning process joyful, and that is the idea that led to the inception of this project.

3 METHODS AND SYSTEM REQUIREMENTS

The primary hardware requirements for the realization of this project would be a Windows or a Mac system, along with an Android or iOS device for testing the AR app.

We would be making use of Visual Studio (C# Platform) for scripting in Unity 3D together for design and development. We would also be using Vuforia for functions such image recognition, and tracking multiple image targets simultaneously.

The proposed technique of interaction is via the smartphone, as it is a handy device that can be carried and used on-the-go. The interplay between the physical objects and the virtual experienced through the screen is what will enrich the learning experience. Here, the physical book or material would be augmented with computer-generated sensory input such as sound, graphics, and video.

2 PROPOSED OUTCOME

As like all design-oriented processes, we start with users, and the user-centric research to gain more insight about our target group. The first step would be identifying the engagement-related issues in traditional ways of learning, and also learning about mixed reality applications that have been developed with a similar goal of a multisensory, multimodal approach to learning. Keeping our target group in mind, which would be children, educators, guardians, and institutions, we will create mind maps, personas, storyboards, and other visual and logical aids backed by our research in the field to obtain further clarity on the current problems, and choose the kind of testing methods that would be most beneficial to our case.

Apart from literature review of published research papers in this field, we would be interviewing educators, guardians, and observing the primary users, i.e. children to know and critically analyze the problems at hand so that we can work with users following a participatory approach from the early stages.

We will keep improving our design over the course of the project and also record our findings for further extension of this work.

4 REFERENCES

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