International Journal of Scientific Research in Engineering and Management (IJSREM)
Volume: 06 Issue: 04 | April - 2022 Impact Factor: 7.185 ISSN: 2582-3930

Augmented Reality in Learning

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ABSTRACT:

We are proposing an Android app based on Augmented Reality, which is going to help to students to learn in more interactive environment. In our modern era where the internet is ubiquitous, everyone using various online resources for learning. In this project, we are developing an android app based on Augmented reality, which is going to help to students and their parents in learning. As we are seeing learning is becoming digital, sometimes it becomes hard to deal with it. This app has various features like educational videos, 3d models, study material, animations, audios for users after focusing the camera via app on book or pictures. This will help to kids to grow more rapidly as well as their parents to solving the problems easily.

Keywords: *Augmented Reality, Android Device, 3D model, Audio, Video.*

INTRODUCTION

Now that students are having to learn from home, keeping students engaged in lectures has become very difficult. Thus, among all the modern trends in E-Learning, the one which is rapidly growing in popularity is Augmented Reality. Technology is no doubt one of the best ways how to engage your kids. It allows overlaying digital content in the real world using your own phone, engaging the kids and parents more quickly and in a new way. Augmented Reality as the name suggest it is a live direct or indirect view of a physical, real-world environment whose elements are "augmented" by computer-generated or extracted real-world sensory input such as sound, video, graphics, haptic or GPS data. It means if you move your mobile camera to space, AR enables you to see a computer-generated object on your screen. Altogether, it happens in real time while you view it from your camera.

As people always keep on looking for something new, so this technology can become a source of attraction. This technique can enable students to learn in a more interactive environment. Augmented Reality is the integration of digital information with the live video and user environment. By recognizing a visual picture, this technology blends new information and display the virtual result in real time, thereby producing extraordinary experiences. Using a mobile application, a mobile phone's camera identifies a marker. By analysing the marker, the software creates a virtual image on the phone's screen. However, due to the number of calculations, only smartphones are capable of supporting augmented reality with success.

Just imagine if your kid just scan the alphabets like A, B, C, D…. And see the 3d object of it or Pronunciation of Alphabets! Or, they scan the poem or lesson and watch the video of it! Or they can do some mathematical operations on screen! There are endless opportunities that AR can bring.

AIM

To develop an application that will help kids to learn in a more interactive environment.

PROBLEM STATEMENT

Look around and you will find that mobile phones and laptops have replaced good old toys. Every time a child is restless, all one needs to do is to play a video for them or show them an online game or use it as bait if they refuse to eat. In no time, your child becomes obsessed with screens. The education sector needs technology adaptation in order to keep the engagement levels high. Augmented Reality is the best way to do this. All you have to have smart phone, some AR worksheets, lessons, poems or books. You will see the difference in the interest of the students towards learning. Because AR has its own magic. It can change the way we interact with mobile apps and other visual graphic experiences. Actually, Augmented Reality is capable of augmenting computer-generated graphics into the real environment on screen.

LITERATURE SURVEY

A mobile AR systems (MARS) is defined as a system which Papagiannakis et al. [2008]: Combines real and virtual objects in a real environment Runs in real time and mobile mode Registers (aligns) real and virtual objects with each other. The virtual augmentation is based on dynamic, 3-D objects (e.g. interactive, deformable virtual characters) these systems vary in display type, reality, immersion, and directness of interaction. Mobile applications [Gunnarsson et al., 2006] use a MAR to visualize wireless sensor node data by overlaying the measurements on camera images. The orientation of the camera is detected with the help of markers. An analysis of the delay and client-side processing required for server-side processing of camera images has been made

by [Chen et al., 2009]. They show that the latency caused by the combination of local processing, network latency, and server-side processing is under one second and should still provide a good user experience. Marker tracking is a heavy operation. [Wagner et al., 2009] investigates the performance of various algorithms. In the end, it is shown that multiple markers can be tracked on current generation telephones while achieving sufficient performance.

- **SKETCHAR(An Android App)** SketchAR is a mobile app with a suite of tools to grow artistic skills, create art, and sell it right from the app.
- **Quiver(An Android App & iPad App)**Allows students go beyond the pictures in their textbooks to interact with three-dimensional figures.
- **JIGSPACE(iPad App)**Allows you create and share stunning augmented reality presentations.
  For schools, businesses, and everyone in-between.
- **FIGMENT(An Android App)**Figment AR turns your world into augmented funhouse. Create imaginative scenes out of the world around you. Add interactive emoji, animals and other playful objects to your surroundings, create "portals" to step into another dimension, and add environmental effects like snow, fireworks and more.
- **BANUBA FACE AR(Web based AR)**Banuba provides a full platform solution for **Face AR** development on the web. Its focus lies in face tracking features making it the best choice for developers who look to augment users.
- **ORB(An Android App)**With Orb, your students can create various 3D objects and place them in a specific location from their physical surroundings. They can create a spider and place it on the teacher's head. How fun is that?

OBJECTIVES

- **A Better Explanation Of Complex And Abstract Concepts**
  There is no doubt that your students will understand the concept better when they will visualize it in reality.
  Especially for the difficult topics, students will get to learn quickly with 3-dimensional model representations.
- **Elevated Student Engagement**
  AR learning provides a gamified approach towards learning; which makes the lessons fun.
  As a result, it serves a positive impact on the students and keeps them engaged.
- **No Extra Tools Required**
  Today,95% of teens continuously use smartphone.
  This can be used for constructive results as well.
  Parents and teachers don't have to spend extra on buying tools for interactive learning and teaching.
- **Accessible Learning**
  With AR apps the users can learn anytime and anywhere from their smartphones.
  It is the best way to replace paper books, posters, huge physical models etc

METHODOLOGY OF THE WORK

This technique can enable students to learn in a more interactive environment. You just need to hold the camera on Alphabets, it will show you 3D view of the model related to that alphabet. For example, if you scan the letter A. It will show the 3D view of Apple. And also it will pronounce what model is this. Like "A for Apple". It provide different study material for the kids. So that they can be engaged with study in a better way.

This app has various features like educational videos, 3d models, study material, animations, audios for users after focusing the camera via app on book or picture.

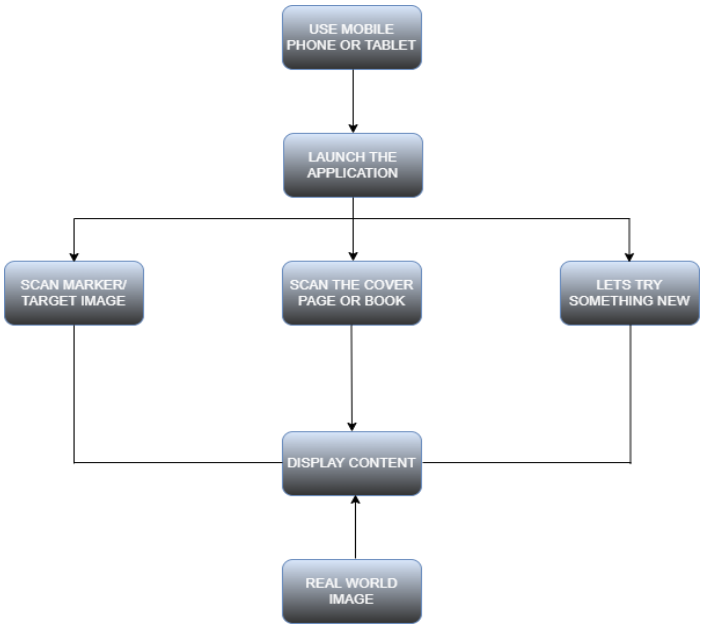

Fig 1. Flow of Proposed System

In Above fig.1 Flow diagram shows procedure to use application. Where after launching the application user has provided with various options to select. After selecting lets try something new, it will show you videos related to study.

If you scan the alphabets, it will show you 3d view of model related to that alphabet. And also the Pronunciation of alphabet.

If you scan the cover page of book then it will show you what contents are there in that book. And if you scan the poem or lesson, then it will show you video of that poem or lesson. So by this application your kids become engaged with study and learn things in more interactive environment.

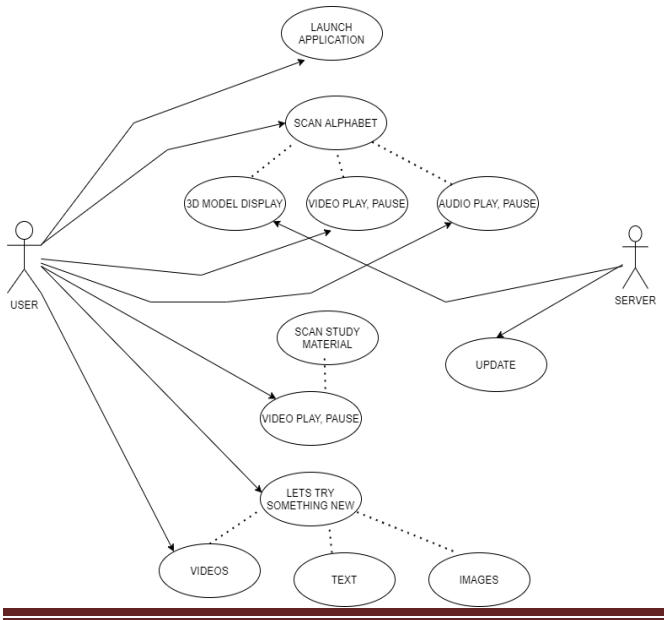

Fig. 2 Use Case Diagram of Proposed System

Fig no. 2 shows the interaction diagram with the system that shows the relationship between the user and the different use cases in which the user is involved.

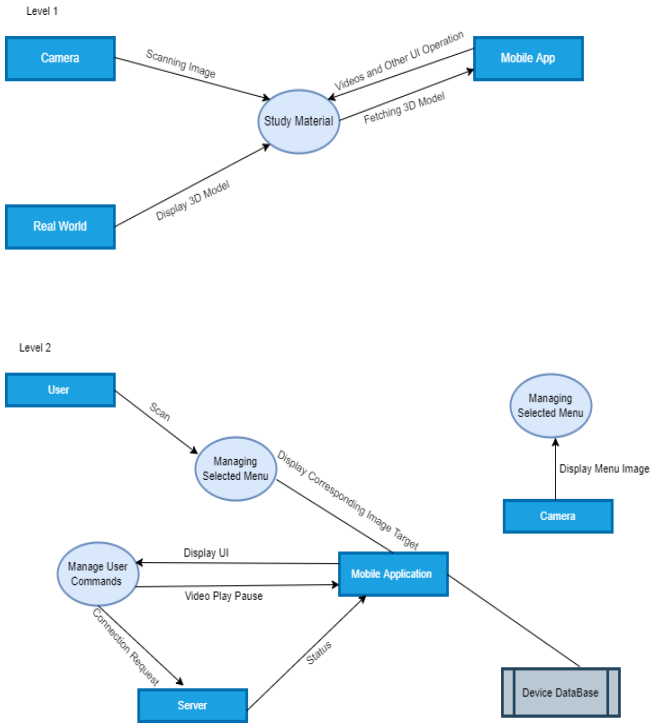

Fig. 3 Data Flow Diagram

Fig. 3 Shows what kind of information will be input to and output from the system, where the data will come from and go to, and where the data will be stored. It does not show information about the timing of process or information about whether processes will operate in sequence or in parallel.

CONCLUSION

The main objective is to build and implement a successful application for kids where they can easily learn basic things with the help of 3D model like alphabets, numbers and also hear the pronunciation of it. Students can see the video of lessons, poems. Doing so the kids can grow with the technology, And will enjoy the learning.

ACKNOWLEDGEMENT

The success and final outcome of this project required a lot of guidance and assistance from many people and we are extremely fortunate to have got this all to complete my project work. Whatever we have done is only due to such guidance and assistance and we would not forget to thank them.

We respect and thank Prof. Rajesh Bothra, for giving us an opportunity to do the project and providing us all support and guidance. We are extremely grateful to him for providing such a nice support and guidance. We owe our profound gratitude to our project guide Prof. Rajesh Bothra, who took the keen interest in our project work and guided us all along, till the completion of our project work by providing all the necessary information for developing a good system.

We heartily thank our internal project guide, Department of Computer Engineering, for guidance and suggestions during this project work.

We are thankful for and fortunate enough to get constant encouragement, support and guidance from all Teaching staffs of Department of computer engineering of ARMIET College. Also, we would like to extend our sincere regards to all the non-teaching staff of department for their timely support.

REFERENCES

[1] "The future directions of mobile augmented reality applications", Study Tour Pixel 2010, University of Twente

[2] Jianqiang Sun, Lei Xie, Qingliang Cai, Chuyu Wang, Jie Wu, and Sanglu Lu,"RF-ISee : Identify and Distinguish Multiple RFID Tagged Objects in Augmented Reality Systems", 2016 IEEE 36th International Conference on Distributed Computing Systems, pp.723,724. https://youtu.be/XLP4YTpUpBI//The Rise Of Technology-Augmented Reality(AR)

[3] Tânia Barata - The influence of Augmented Reality in the teaching and learning process||, 2021 16th Iberian Conference on Information Systems and Technologies (CISTI), Published: 2021

[4] Kapil R. Dandekar, Wireless Communications Engineering via Augmented Reality, IEEE Frontiers in Education Conference (FIE). Published: 2016.

[5] Barnum, P. et al. "Dynamic seethroughs: Synthesizing hidden views of moving objects. In Mixed and Augmented Reality", 2009. ISMAR 2009. 8th IEEE International Symposium on, pages 111-114. 2009.

[6] Caudell, T. and Mizell, D. "Augmented reality: An application of heads-up display technology to manual manufacturing processes", In roceedings of the Hawaii International Conference on System Sciences, volume 25, pages 659-659. IEEE INSTITUTE OF ELECTRICAL NDELECTRONICS, 1992.

[7] Chen, D. et al. "Streaming mobile augmented reality on mobile phones", In Proceedings of the 2009, 8th IEEE International Symposium on Mixed and Augmented Reality, pages 181-182. Citeseer,2009.

[8] Gunnarsson, A. et al. "Visualization of sensor data using mobile phone augmented reality", In Proceedings of the 2006 Fifth IEEE and ACM International Symposium on Mixed and Augmented Reality (ISMAR'06)-Volume 00, pages 233-234. IEEE Computer Society, 2006.

[9] Hong, Y. et al. "Mobile pointing and input system using active marker", In IEEE/ACM InternationalSymposium on Mixed and Augmented Reality, 2006. ISMAR 2006, pages 237-238. 2006.

[10] Milgram, Paul, T.H.U.A.K.F. "Augmented reality: a class of displays on the reality-virtuality", continuum. volume 2351, pages 282-292. 1995.

[11] Papagiannakis, G., Singh, G. and Magnenat-Thalmann, N. "A survey of mobile and wirelesstechnologies for augmented reality systems", Computer Animation and Virtual Worlds, 19(1):3,2008.

[12] Seichter, H. et al. "Multitouch interaction for Tangible User Interfaces", In Mixed and AugmentedReality, 2009. ISMAR 2009. 8th IEEE International Symposium on, pages 213-214. 2009.

[13] Wagner, D., Schmalstieg, D. and Bischof, H. "Multiple target detection and tracking with guaranteedframerates on mobile phones", ISMAR09, 2009.

[14] Thomas, B. "Evaluation of three input techniques for selection and annotation of physical objectsthrough an augmented reality view", pages 33- 36. 2007