

# Mahima - Education Purpose Machine Learning Technology

S. Piyashkara, M.S.M. Ahamed, P. Thuvarakan, Aruna Ishara Gamage, Didula Chamara

Department of Computing  
Sri Lanka Information Technology  
Malabe, Sri Lanka  
*IT19100326@my.sliit.lk*

Department of Computing  
Sri Lanka Information Technology  
Malabe, Sri Lanka  
*IT19959474@my.sliit.lk*

Department of Computing  
Sri Lanka Information Technology  
Malabe, Sri Lanka  
*IT19980850@my.sliit.lk*

**ABSTRACT-** Since most institutions and schools are switching to online or hybrid techniques due to the COVID-19 epidemic, e-learning has been expanding rapidly. With this technology of ours Mahima, we want to give students a real classroom education experience with complete efficiency in a 3D Environment. Classes or learning experiences that take place in unrealistic virtual reality settings are referred to as virtual reality classes. This indicates that the environment is an abstract representation of a real-world object or place rather than a direct simulation of it. These courses or learning opportunities can serve several objectives, including the teaching of abstract scientific or mathematical ideas as well as the promotion of artistic expression and creativity. Students can interact with digital objects and environments in novel ways that would not be possible in a traditional classroom setting, making abstract virtual reality courses very immersive and engaging. The following are some instances of abstract virtual reality courses: An interior-representative virtual reality setting. The primary goal of this research study is to improve the effectiveness of the online educational system, and we will be focusing on the technologies such as Video processing, Natural Language Processing and Artificial Neural Networks, to develop Virtual Reality (VR) Technology and reduce the workload for instructors and students. 3D Avatar Animation Processing is one of the most accurate ways to monitor human behavior. Eye-tracking is a technique for capturing real-time, objective user behavior. Eye motions are quick, subconscious movements communicating information that even the responder is unaware of. Subject and help them utilize their time in an effective manner with less effort while referring to a subject or preparing for the examination.

**Keywords-** Natural Language Processing, Video Processing, Virtual Classroom, E-Learning, Machine Learning, Virtual Reality, Visual Computing

## I. INTRODUCTION

Mahima was an interactive system student and lectures can communicate each other's and it gives students an opportunity to learn from their favorite animated characters. Creating an interactive system that can deliver the university experience virtually. It's make student to more active to learn. Also, students can login in to the system using animated character.

Through the provision of a distinctive and immersive learning experience that can improve student involvement, comprehension, and retention, virtual reality has the potential to revolutionize education as we currently know it.

Students may benefit from interactive, interesting educational experiences outside of the conventional classroom with the help of a virtual reality education system. Students can investigate historical sites or science ideas, for instance, in a three-dimensional setting, which brings these ideas to life and makes them more concrete and memorable.

Additionally, virtual reality can offer chances for hands-on learning that might not otherwise be possible by allowing students to simulate real-world scenarios in a secure and controlled environment. For instance, engineering students can try designs and prototypes without running the risk of

causing physical harm, while medical students can practice procedures on virtual patients. The way we handle education could be revolutionized by virtual reality. Students' learning processes are already beginning to change because of the use of virtual reality technology in the classroom.

Students can learn difficult ideas and concepts in a more intuitive and natural manner with a VR educational system. For instance, history students can virtually tour historic locations and experience important events as if they were there. Medical students can perform surgical procedures in a secure setting by simulating them.

Additionally, learning that is customized and flexible is possible with VR. Students can learn at their own speed and in their own way, and VR can offer real-time feedback and change the level of challenge based on how well the student is doing. Moreover, by giving students immersive, interactive learning experiences that go beyond what conventional teaching methods can give, virtual reality has the potential to revolutionize education. Students can explore and interact with digital environments and simulations in a virtual reality education system, which helps them better grasp difficult ideas and develop their critical thinking abilities.

Virtual reality can engage students in a way that conventional methods cannot, which is one of its most important educational benefits. VR can make learning more engaging and enjoyable by submerging students in virtual worlds, which can boost motivation and memory recall.

The ability of virtual reality to establish secure and regulated learning environments for pupils is another benefit. For illustration, pupils

## II. USE & DESCRIPTION

### A. Get Start

To assist you in getting started with Meta Quest app development in Unity, this guide includes topics that are organized in a particular order. The order itself creates a structured process that aids in the setup of your development environment and your familiarization with the basics of Meta Quest and Unity.

This topic describes how to set up your development environment to build Meta apps in Unity. It contains information about hardware and software requirements, setting up Meta headsets, and installing Unity Editor, and other necessary tools.

- Development Software:
  - Unity Editor
- Hardware Requirements
  - VR Headset
- Minimum System Requirements:
  - 2.0+ GHz processor
  - 2 GB system RAM
- Software Requirements Operating System (anyone):
  - Windows 10 (64-bit versions only)
  - macOS Sierra 10.10

#### - SDK and XR Plugin

The Oculus Integration SDK, also known as the Oculus Integration Unity package, is a one-stop shop for essential VR features, components, scripts, and modules that make it simpler and more effective to create apps in Unity. It bundles a number of SDKs, including interaction, voice, and platform SDKs, among others, and offers advanced rendering, social and community development, and the ability to create immersive experiences.

#### - Configure Settings

This article covers fundamental Unity settings that can be used to improve the quality and performance of your app as well as speed up the app creation process. To comply with the minimal technical requirements stated in the Meta Quest store policies and guidelines, we advise that you use the settings described in this guide. Not all the Unity editor's settings are covered in this subject.

#### - Camera

The Overpampering prefab, which offers the transform object to depict the Oculus tracking space, is part of the Oculus Integration SDK. To fine-tune the relationship between the head tracking reference frame and your environment, it includes a tracking space game object. The primary Unity camera, two anchor game objects for each eye, and controller anchors for the left and right hands are all located under the

tracking space object. Additionally, a custom Virtual camera is included, which takes the place of Unity's standard camera.

#### - Guardian System

The app must be able to monitor and translate a user's movement in the real world to the virtual world to create an immersive app. It must be aware of when the user leaves the field of view of the tracking camera to prevent losing track of their location, which can be a startling experience.

#### - Add Splash Screen

The VR runtime-driven splash displays can be added using the Oculus Integration SDK. The main advantage of including splash screens with the Oculus Integration SDK is that it provides a high-performance, high-quality substitute to typical implementations that rely on the application layer and loads a lot quicker than their application-driven counterparts.

#### - Input Modalities

A unified input API is made available by Reinput for various controller kinds. It is used to access raw or simulated controller state, including information from capacitive touch screens, triggers, and buttons. The Meta Quest Touch devices are supported. Use the Unity Engine to operate with the keyboard and mouse. input scripting API (for more details, see Unity's input scripting reference). If they do not already exist, mobile input bindings are immediately added to Input Manager. Asset.

#### - Hand Tracking

For the Meta Quest headsets, hand tracking allows the use of hands as an input method. With completely tracked hands and articulated fingers, using the hands as an input modality creates a new feeling of presence, improves social engagement, and produces more natural interactions.

#### - Interaction SDK

A collection of components from the Interaction SDK is available for your use in adding controllers and hand interactions to your experiences. Incorporating best practices and heuristics for user encounters on Meta Quest devices are interaction models like ray, poke, and grab. Both basic and complex applications can use components because they are made to be modular and composable. Interaction SDK offers hand-specific interaction models, pose and motion recognition, as well as visual affordances that are focused on the hands.

#### - Tracked Keyboard SDK

Users have an effective method to use their physical keyboard in a VR environment thanks to the Tracked Keyboard SDK. The SDK gets around the drawbacks of virtual keyboards and blind touch typing by rendering a user's hands on top of a VR depiction of their keyboard. a representation of a tracked keypad in a virtual reality setting.

#### - Voice SDK

You can add speech interactions to your app experiences with the help of the Voice SDK. Utilize the Voice SDK to add more flexible and natural methods for users to interact with the app, enhancing the AR/VR experience. Voice commands, for instance, can shorten controller operations with a single word, and interactive conversation can improve the app's appeal.

#### - Build Tools

How to set up Unity's build settings is covered in this subject. The main steps in the build process are choosing the build platform, such as Android or Windows, adding scenes, setting up VR support, and building the app. To further optimize build time and app speed, quality and rendering parameters are also configurable.

#### - Package Capabilities - Rendering

Application Space Warp (AppSW) is a feature that significantly improves speed and latency while achieving a step function improvement. One of the biggest improvements ever sent to Quest developers. In our preliminary testing, it provided applications with up to 70% more compute, possibly with little to no discernible artifacts. Although it is a useful optimization, its proper implementation necessitates a thorough knowledge of the technological factors and tradeoffs. We have produced this manual to assist you in using AppSW to its full potential.

#### - Focus Awareness for System Overlays

Focus awareness allows many forms of Meta Quest system user interfaces (UI), such as universal menu or system keyboard, to appear as an overlay on top of an app without pausing the immersive experience. This allows users to access the system UI without context switching away from the app, keeping users engaged in the experience. Focus awareness uses the concept of input focus, a system for tracking whether the user is focused on the app or elsewhere, to correctly handle times when the app is running but the user is interacting with system UI. Based on input focus, apps can take appropriate action when an overlay appears. For example, when the universal menu appears on top of an app, the app continues to run but may pause the gameplay as the input focus is lost.

#### - Mixed Reality Passthrough

**Health & Safety Recommendation:** We strongly advise developers to assess their content to support a relaxing and secure experience for users while creating mixed reality experiences with the Passthrough API. For more details, see the Mixed Reality Design Guidelines topic. In the Meta Quest headsets, Passthrough offers a real-time and perceptually relaxing 3D representation of the outside world. Developers can incorporate the passthrough visualization into their virtual encounters using the Passthrough API.

#### - Scene

We strongly advise assessing your content as you create mixed reality experiences to ensure that your users have a pleasant and secure experience. Before designing and building your app using Scene, please review the Health and Safety and Design guidelines.

#### - Meta Avatars

Developers can offer user-created Meta Avatars to boost social presence and Virtual immersion using the Meta Avatars SDK. Avatars are offered as modularized full-body torsos, giving users the freedom to design a distinctive personality that is persistent throughout the Meta ecosystem. Realistic Avatar poses can be extrapolated from the Meta headset and Touch controllers using advanced body tracking, giving users a feeling of self in a virtual environment.

#### - Movement

Body, face, and eye tracking are used by Movement SDK for Unity to introduce a user's physical movements into the metaverse and improve social interactions. Developers can animate figures with social presence and offer features beyond character embodiment by using the abstracted cues that tracking offers.

#### - Meta XR Audio SDK

This manual outlines procedures and tools for producing an engaging Virtual audio experience in Unity. We advise starting with the Unity Audio guide if you are not acquainted with Unity's audio handling. For a VR or MR encounter to be persuasive, audio is essential. Any effort development teams make to implement audio cues should be worthwhile because they play a crucial part in our perception of being present in a real, physical environment. This will increase the user's feeling of immersion. Free, simple-to-use spatialized modules are offered by Meta for a variety of middleware and game engines, such as Unity and Unreal. Both PCVR and Quest programming are supported by our spatialization features. One key aspect of how we can locate audio sources in three-dimensional space.

#### - Oculus Audio SDK

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#### - Platform Solutions

You can use the features provided by the Meta Quest Platform to design fun and interactive social gaming experiences. By utilizing the Meta Quest Platform, you can concentrate on creating your game. You can mix and match the features you use to make your own special gaming experience using platform features. Each element helps achieve one of our platform's goals: Identity – Use the user's friends list to customize the program. Make it simple for users to connect with and discover friends. Users who are more engaged come back more often and use VR for longer periods of time. Encourage users to use, interact with, and download your program again. Increase the revenue.

### **B. Maintaining the Integrity of the Specifications**

Maintaining the integrity of the specifications for a virtual reality classroom is essential to ensure that the literacy experience is harmonious and effective. There are some crucial ways to take to maintain the integrity of the specifications. Establish clear specifications. Before enforcing a virtual reality classroom, it's important to establish clear specifications for the system, including tackle conditions, software compatibility, and performance marks. This will help ensure that the system is harmonious and meets the requirements of the intended druggies.

Regularly update and maintain the system Virtual reality technology is constantly evolving, and it's important to regularly modernize and maintain the system to ensure that it remains compatible with the rearmost software and tackle. This may involve regular software updates, tackle upgrades, and regular conservation checks.

Test the system regularly Regular testing is pivotal to ensure that the virtual reality classroom is working as intended. This may involve conducting performance tests, checking for comity issues, and covering stoner feedback. give training and support Virtual reality technology can be complex, and it's important to give acceptable training and support to druggies to ensure that they can use the system effectively. This may involve furnishing stoner primers, online tutorials, or in- person training sessions.

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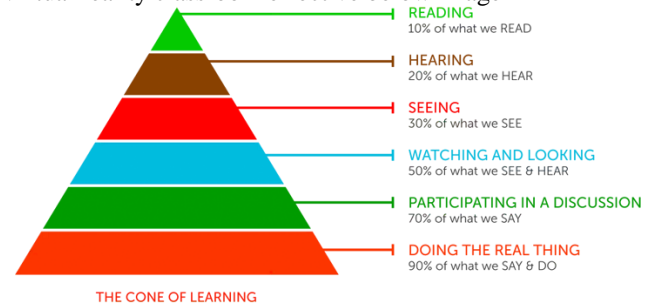
Establish programs and procedures to maintain the integrity of the virtual reality classroom, it's important to establish clear programs and procedures for its use. This may involve setting rules for behavior in the classroom, establishing procedures for reporting technical issues, and setting guidelines for piercing and using the system.

By taking this way, you can help ensure that the virtual reality classroom remains harmonious, effective, and aligned with the established specifications. in the classroom, establishing procedures for reporting specialized issues, and setting guidelines for penetrating and using the system. By taking this way, you can help insure that the virtual reality classroom

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### III. METHODOLOGY

Virtual reality classroom effective below image



**Figure 1:** Virtual Reality eLearning Out Come

A virtual reality classroom's approach can be divided into the following steps.

Define the course's educational aims and learning outcomes by identifying the course's learning objectives. This will direct how the VR world is created. Selecting a Virtual platform Choose a VR platform that is compatible with the course's educational goals and learning results. This might entail comparing various Virtual platforms and technologies. Create VR content: Produce VR material that advances the course's learning goals. This could entail developing dynamic components, simulations, and 3D models.

Develop the virtual classroom setting, including the furniture, lighting, and audio. Design the VR classroom. Make sure it encourages engagement and supports the learning goals. Test and improve: Have pupils beta test the VR classroom. The methodology for a virtual reality classroom can also include the following extra steps:

Give instruction: Give pupils the instruction they need to use the VR tools and technology, as well as an orientation to the VR classroom. Support, internet tools, and tutorials can all fall under this category. Encourage participation and interaction by giving students chances to interact with the VR world and with one another. Collaboration exercises, group tasks, and discussions fall under this category.

Use metrics like completion rates, quiz scores, and feedback to keep track of students' growth and achievement in the virtual reality classroom. Utilize this data to pinpoint potential growth areas and make any necessary adjustments to the VR environment. Give advice and assistance: Give pupils criticism on what Define learning Objects Identify the educational pretensions and learning issues of the course. This will guide the design of the VR terrain. elect a VR platform Choose a VR platform that aligns with the educational objects and learning issues of the course. This may involve assessing different VR technologies and platforms.

Develop VR content produce VR content that supports the literacy objects of the course. This may involve creating 3D models, simulations, and interactive rudiments. Design the VR classroom Develop the virtual classroom terrain, including the layout, lighting, and audio. ensure that it



supports the literacy objects and promotes engagement. Test and upgrade Test the VR classroom with scholars or beta testers to identify any issues or areas for enhancement. upgrade the VR terrain grounded on feedback. apply Launch the VR classroom and give access to scholars. ensure that they've the necessary tackle and software to share.

quizzes, and interactive lectures. These procedures are improved using virtual reality technology, which gives pupils a more immersive and engaging experience.

Estimate and acclimate Continuously estimate the effectiveness of the VR classroom in achieving the literacy objects and making necessary adaptations grounded on feedback. Throughout this process, it's essential to involve preceptors, educational contrivers, and VR inventors to ensure that the VR classroom aligns with the educational pretensions and promotes literacy. also, it's important to consider the availability and inclusivity of the VR classroom, accommodating scholars with different literacy requirements and disabilities. By following this way, preceptors can produce a comprehensive and effective virtual reality classroom methodology that supports literacy and engagement for scholars.

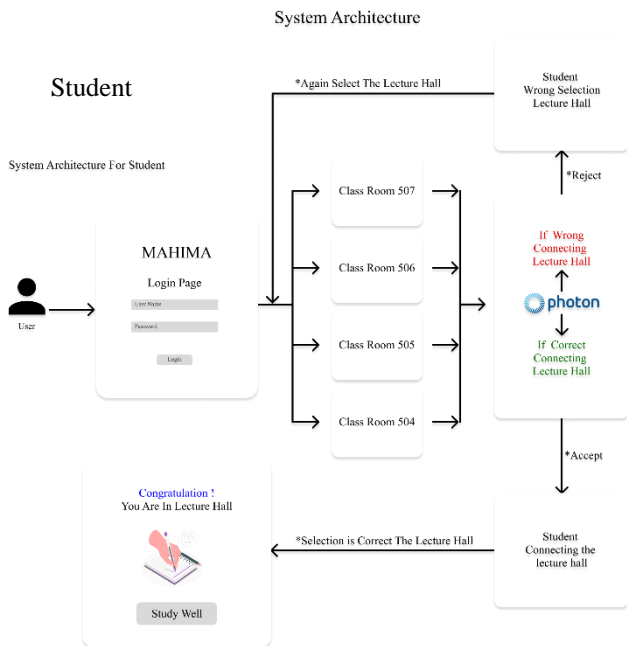


Figure 2: - System Overview Diagram Mahima -

First, students are welcomed by a login screen when they access the Mahima platform. The diagram type tow one is Student Diagram other one is Lecture Diagram

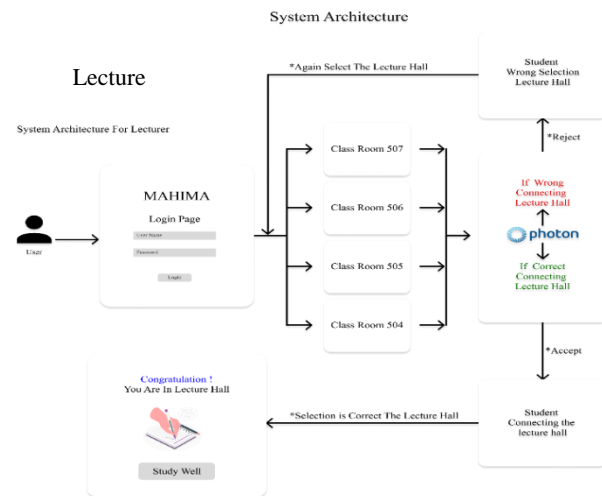


Figure 4: - System Overview Diagram Mahima -

First, students are welcomed by a login screen when they access the Mahima platform. Mahima is at the vanguard of this transformation in how we learn thanks to the use of virtual reality technology. The photon methodology is used by Mahima, a virtual reality classroom tool, to produce an immersive and interactive eLearning experience. This platform offers a fresh method for instructors and students to interact with educational materials, enhancing and enhancing learning.

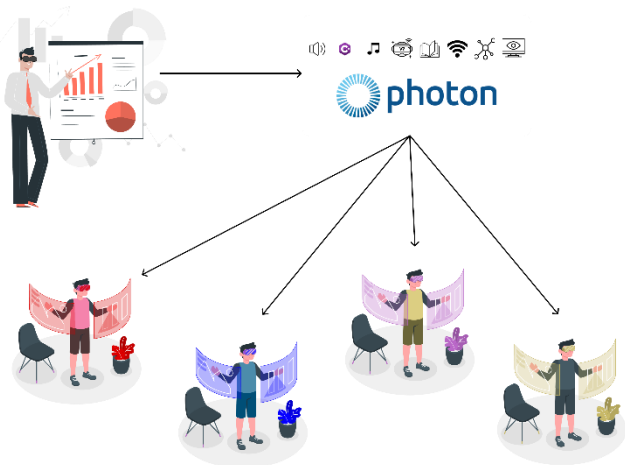


Figure 3: - Photon workflow Diagram

Photon Methodology: A potent instrument that makes it possible to create lifelike virtual environments is photon methodology. This approach simulates the behavior of light in a virtual setting using a process called photon mapping. By doing so, a realistic lighting effect is produced, giving the virtual world a genuine appearance and feel. The photon methodology is especially helpful in building virtual classrooms because it enables the creation of a realistic learning environment. Supporting eLearning Processes: Mahima provides support for a range of eLearning procedures, such as interactive group talks, interactive

The virtual reality classroom at Mahima offers pupils several advantages. It provides a more interactive and interesting learning experience, to start. Students' ability to concentrate and retain information is facilitated by the immersive nature of virtual reality, which gives them the impression that they are in a real classroom. Additionally, by visualizing complicated ideas in a more concrete manner, virtual reality can make them simpler to comprehend. Students who learn best visually may find this to be particularly helpful. The limitations of conventional e-learning techniques can also be surmounted by students with the aid of virtual reality classrooms.

**A.E-learning environment and Student**

Students are restricted to a computer screen and can only use visual and auditory inputs in a conventional e-learning environment. Virtual reality, however, enables students to

engage with the course content in a. Despite the advantages of virtual reality, it's crucial to remember that it shouldn't be used as a substitute for conventional classroom instruction. It should be added as a complement to improve learning instead. Although virtual reality classrooms can increase participation and interaction, they shouldn't take the place of in-person communication and human connection.

In conclusion, Mahima's virtual reality school provides a fun and cutting-edge method of education. The platform's photon technology makes it easy to enter the virtual reality classroom and offers a seamless, immersive learning environment. Students can gain from virtual reality classrooms in several ways, including improved involvement, interactive learning, and visualization of challenging ideas. However, it's crucial to keep in mind.

### B. Virtual Reality Classroom and its Impact on Student Studies

- Virtual Reality Classroom Although the traditional classroom approach has been effective for many years, it does have some drawbacks. Keeping students interested is difficult, and not all students will respond well to a one-size-fits-all strategy. These issues are addressed by the
- Mahima - Virtual Reality School. With the help of VR technology, students can engage with a subject in a manner that is not possible in a conventional classroom. They can visualize difficult ideas, interact with virtual objects, and explore historical locations in a way that makes learning enjoyable and interesting.
- The Mahima - Virtual Reality Classroom has a major influence on students' academic performance. VR technology increases knowledge transfer, improves pupil retention rates, and creates a more individualized learning environment. People may study at
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### C. Effect Virtual Reality Effect Student Studies Percentage

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Virtual reality has had a sizable impact on student academics. 90% of pupils who used VR technology said it enhanced their learning, according to a survey by the Virtual Reality Society.

Additionally, students who used VR technology had average test scores that were 14% better than those who did not.

Because VR technology is so immersive, students can interact with the material in a way that makes learning more enjoyable and entertaining. Additionally, it offers a more customized learning environment that accommodates various learning preferences. Virtual reality technology can be very helpful for students who have trouble learning in a conventional classroom setting.

Virtual reality (VR) era has been gaining reputation in the education area during the last few years. Its immersive and interactive nature has made it an attractive device for educators seeking to beautify pupil gaining knowledge of. In step with a report via Technavio, the worldwide schooling VR market is expected to grow at a CAGR of over 59% from 2019-2023. Here is a breakdown of the percentage utilization of VR schooling the world over:

North the us:

North the USA is the biggest market for VR schooling, accounting for over 38% of the global marketplace percentage. The growth of VR training in North the us is attributed to the region's excessive adoption of technology, a sturdy education system, and the presence of predominant VR education answer companies.

#### Europe:

Europe is the second-largest marketplace for VR schooling, accounting for over 28% of the global marketplace share. The boom of VR training in Europe is pushed by the area's recognition on providing extraordinary schooling, growing investment in era, and the developing call for customized and immersive learning experiences.

#### Asia Pacific:

The Asia Pacific region is predicted to witness the very best boom price for VR education, with a CAGR of over sixty three% from 2019-2023. The increase of VR education within the vicinity is attributed to the growing adoption of generation, developing investment in training, and the need for revolutionary mastering answers to cope with the challenges posed by way of the COVID-19 pandemic.

#### Relaxation of the sector:

The relaxation of the world, which includes regions like Latin America, the middle East, and Africa, debts for the remaining marketplace percentage of VR training. The growth of VR education in these areas is driven via elements just like the increasing adoption of generation, growing call for outstanding training, and the want for personalized and immersive learning reports.



Figure 5: - Mahima

## RESULT

The program was a virtual reality e-learning application that gave users the chance to learn, engage with the virtual world, and test their knowledge through interactive games and quizzes. It was created with ease of use and intuitiveness in mind, and was compatible with several gadgets, such as computers, tablets, and smartphones. The program was an effective e-learning tool that allowed to learn in a lifelike virtual setting.

## CONCLUSION & FUTURE WORK

By giving them a platform to communicate, cooperate, and study on, this technology will assist in developing a productive virtual environment for both teachers and students. By offering a real-time e-learning experience, the system also attempts to cut down on the time and effort required for the learning process. As sup objective we are providing a chat bot inside the system students can get their answer for questions what they ask about academic things.

There are flowing few things can be done to extend our System.

NLP currently available for only few languages if we expand the availability for maximum number of languages it should be very good.

If we implement an access for the VR Environment without waring VR Headset it should be expand the accessibility of the system.

To handle any potential dangers or vulnerabilities that our system may encounter, we also want to create a contingency plan.

## ACKNOWLEDGMENT

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