

## Exploring Virtual Reality Through Web-Based Applications

### Introduction

Creating a virtual reality (VR) experience without extra equipment can be challenging, but it's possible to simulate VR experiences using accessible tools and technologies. Here's a lab idea for school teachers to introduce students to VR concepts without the need for advanced equipment.

### Overview

- Introduce participants to the concept of virtual reality.
- Explore web-based VR applications that do not require specialized VR equipment.
- Develop an understanding of how VR can be used in education.

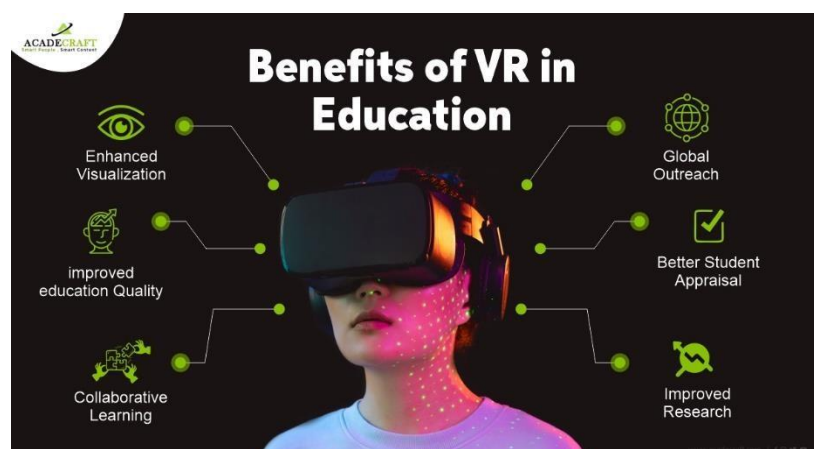
### Lab 1: Introduction to Virtual Reality

#### Brief Presentation:

- Explain what virtual reality is and how it works. \*
- Discuss the difference between immersive VR (using headsets) and non-immersive VR (using screens).

#### Discussion:

- Ask participants to share what they know about VR.
- Discuss potential applications of VR in different fields, including education.



## Lab 2: Exploring Web-Based VR Applications

### Web VR Experiences:

Guide participants to explore the following web-based VR experiences. These experiences can be viewed on a regular computer or tablet without any extra equipment:

1. Google Earth VR: Allows users to explore the world in 3D
2. VR Roller Coaster: A virtual roller coaster experience. VR Roller Coaster (Note: This is a 360-degree video on YouTube)
3. Smithsonian National Museum of Natural History Virtual Tour
4. NASA's Curiosity Rover: Experience Mars

### Activity:

1. Divide participants into 4 groups.
2. Assign each group a different VR experience to explore.
3. Ask each group to take notes on their experience, focusing on:
  - What they saw and interacted with.
  - How realistic the experience felt.
  - Educational potential of the VR experience.

## Lab 3: Sharing and Reflection

### Group Presentations:

- Each group presents their VR experience to the class.
- Discuss the educational potential and limitations of each VR application.

### Reflection:

- Conduct a class discussion on how VR could be integrated into their current curriculum.
- Ask teachers to brainstorm other subjects or topics that could benefit from VR experiences.



## Lab 4: Creating Simple VR Content

- Introduction to 360-Degree Photos/Videos:
- Explain how 360-degree photos and videos a form of VR are.
- Show examples and explain how they are created.

### Activity:

- Have participants use their smartphones to create simple 360-degree photos or videos using available apps like Google Street View.
- Share and discuss these creations in class.

**Thank you for participating!**



## \* What is Virtual Reality?

### How Does Virtual Reality Work?

#### 1. VR Hardware:

- Head-Mounted Display (HMD)
- Controllers and Gloves
- Sensors
- Computers/Consoles/Smartphones

#### 2. VR Software:

- Virtual Environment
- Rendering
- Interaction Models

#### 3. Creating the Immersive Experience:

- Field of View (FOV)
- Frame Rate
- Head Tracking
- Positional Tracking
- Audio

### Applications of Virtual Reality

#### 1. Entertainment:

- Gaming: Immersive gaming experiences where players feel like they are inside the game world.
- Movies and Videos: 360-degree videos and immersive storytelling experiences.

#### 2. Education and Training:

- Simulations: Flight simulators, medical training simulations, and other educational tools that allow for safe, controlled, and repeatable training environments.
- Virtual Classrooms: Interactive lessons and virtual field trips.

#### 3. Healthcare:

- Therapy: VR is used for pain management, physical therapy, and treating conditions such as PTSD and anxiety.
- Surgical Training: Allows surgeons to practice procedures in a risk-free environment.



#### **4. Industry and Design:**

- Prototyping: Designers can create and interact with virtual prototypes before building physical models.
- Architectural Visualization: Architects can walk clients through virtual models of buildings.

#### **5. Social and Communication:**

- Virtual Meetings: VR platforms for remote collaboration and social interaction.

