PROJECT OBJECTIVE

• University of Houston was unprepared for an abrupt shift to online education due to COVID.
• We propose a technology-based VR solution to replicate the in-class/lab experience.

PROBLEM STATISTICS

• The college of technology cannot provide oscilloscopes, multimeters, breadboards, and components to each individual student as it is too expensive.
• As the current cost of tuition increases the value of education is not reflected in the cost.

EXISTING SOLUTIONS

Pre-Covid Technology Solution

• Function Generator
• Oscilloscope
• Waveform Generator
• Multimeter
• Spectrum Analyzer

Covid Technology Solution

• Analog Discovery Studio
• WaveForms software to access lab equipment at home

OUR TEAMS SOLUTION

• Create 3D Virtual Reality lab environment with breadboard, oscilloscope, multimeter, and components.
• Gamify the learning experience
• Level up throughout the semester

WHAT: We will create a VR application to help students continue to use lab equipment and learn about electronic components.
HOW: Collaborate with College of Technology at the University of Houston.
WHY: To solve the problem of not having the option for in-person teaching or labs.

FINITE STATE MACHINE

TECHNICAL CONTENT

Hardware
• Oculus Quest II VR Headset

Software
• Unity 3D

COST REDUCTION

Pre-Covid COT Lab Equipment Cost | Current COT Lab Equipment Cost | VR Education Cost
---|---|---
Multimeter-$400 | Analog Discovery Studio - $600 | Oculus Quest 2 64 GB - $300
Oscilloscope-$300 | BNC Oscilloscope Probes - $40.00 | Unity Engine - FREE
Function Generator-$400 | Breadboard-$20 |
Total = $1120 | Total = $640 | Total = $300

Pre-Covid to Current Cost | Current to VR Ed Cost | Overall Cost
---|---|---
(1120-640) / 1120 * 100 = 42.85% | (640-300) / 640 * 100 = 53.13% | (1120-300) / 1120 * 100 = 73.21%

CONCLUSION

• Solve the issue online learning though virtual lab
• Reduce costs through making equipment digital.
• Gamify the learning experience.

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