Immersive Mobile Technologies: Virtual/Augmented Reality Technologies in the Classroom

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What is this?
Augmented Reality

Augmented reality is a view of the real world with virtual elements overlaying it.

Pokémon Go is an example of augmented reality or AR
Virtual Reality

Virtual reality is a realistic and immersive experience of a virtual world.
VIRTUAL REALITY (VR)
Completely digital environment
Fully enclosed, synthetic experience with no sense of the real world.

AUGMENTED REALITY (AR)
Real world with digital information overlay
Real world remains central to the experience, enhanced by virtual details.

MERGED REALITY (MR)
Real and the virtual are intertwined
Interaction with and manipulation of both the physical and virtual environment.
Augmented Reality: Definition

“a real time direct or indirect view of a physical real world environment that has been enhanced/augmented by adding virtual computer generated information to it”
(Carmigniani et al. 2011)
AR in Education

1. AR enhances problem solving, increases motivation, and improves performance (Wasko 2013, Billinghurst 2012)

2. Students have more authentic learning experiences (Klopfer 2008)

3. “Potentially more exciting for educators” (Bower 2013)
Methodology

1. Select images from a textbook, prepare slides or background images

2. Record video in IU Media Lab - Green Screen technology

3. Use Aurasma studio to combine images and videos
Implementation
Our Students

Vocabulary

Pronunciation

Comprehension

Grammar
Virtual Reality: Definition

“computer interface that permits the user to interact in real time, in a tridimensional space generated by a computer, using their feelings, through special devices”
(Kimer. 2012)
VR in Education

1. VR provides access to a visual-spatial dimension not available with 2D or abstract learning (Sorby 2009).

2. Multi-sensory VR environment helps increase engagement with content and knowledge retention.

3. VR can help “discover, explore and build knowledge about places and situations that we could never explore” (Piovesan et al. 2012).
VR Environments for Education

1. Computer-generated environments (games and simulation)
2. 360-degree images
3. 360-degree videos
Doing 360
Our Students
360 Images and Videos
The KODAK PIXPRO Orbit360 4K VR Camera adopts a minimalist approach to an all-in-one 360° VR camera, with two fixed focus lenses housed by a futuristic camera body. Each curved lens is designed to work in tandem, to capture full 360° 4K Video and easily upload 360° videos and photos to social media platforms like Facebook™ and YouTube™ via the camera’s Smart Device App while on the go.

KODAK PIXPRO Digital Cameras – Tell your story.
Learn how to work with VR media directly in Adobe Premiere Pro, including stereo media, so you can edit sequences, apply special effects, and output 360-degree projects tagged properly for media players.

If you want to follow along with this tutorial, use the VR Video assets. Click Save to Creative Cloud to copy the assets to your account.
Current VR Implementations
VR and mixed reality headsets

Viewing 1-6 of 6 results

Microsoft HoloLens Development Edition

⭐⭐⭐⭐⭐

$3,000.00

Oculus Rift + Touch

⭐⭐⭐⭐⭐

$499.00

HP Windows Mixed Reality Headset Developer Edition

⭐⭐⭐⭐

$329.00

HTC VIVE Virtual Reality System

⭐⭐⭐⭐⭐

$599.00
Installation is very simple

Assemble Cardboard Viewer
Hands-on Session

1. Smart Phone
2. Cardboard Viewer App
3. Google Street App
4. YouTube App
Google Street

- Chile

- Can walk using Arrows
- Only 360 panoramic view
360 Videos on YouTube

1. BBC - Snow leopards in 360
2. National Geographic – 360 Volcano Eruption
3. Time – Rogue One behind the scene (LifeVR)
VR + AR - ThingLink

1. Import 360 image
2. Augment with Video, Quiz, Reading
3. Accessible on smart phones or web
4. Shareable lesson collections

https://www.thinglink.com/video/888135368845557761
Mixed Reality with the Microsoft HoloLens
Mixed Reality

What Microsoft calls Mixed Reality, Intel calls Merged Reality and similar terms are blended reality or hybrid reality.

These terms are a little squishier than VR and AR in that blended reality implementations are essentially advanced AR systems.

The real distinction is MR is considered a simultaneous blend of both virtual and real worlds to create experiences where both exist and interact with one another.
How Consumers Feel When Watching Content in VR

(U5)

- Interested: 65%
- Amazed: 58%
- Excited: 49%
- Surprised: 32%
- Happy: 25%
- Energetic: 19%

N = 1,300
Source: Greenlight VR, Cubicle Ninjas, 2016
Use Cases and Content

• 360 degree educational video
• Architectural design
• Augmented reality anatomy
• Automotive dealer: virtual test drive
• Logistics and package delivery management
• Real estate virtual property tours
• Remote surgery
• Retail store: virtual fitting rooms
• Virtual reality grid control

http://www.idc.com/tracker/showproductinfo.jsp?prod_id=1381
HoloLens User Interface
GESTURE
Tap is similar to a mouse click
The air-tap gesture

• To air-tap, make a fist in front of you, with the back of your hand facing you. Your elbow should be bent at your side in a comfortable position.

• Now, raise your index finger to the sky and then tap, by flexing your index finger down (the press) and then back up (the release).

• An air-tap results in a select operation. Other ways to select are using a clicker or the voice command "select." The same air-tap gesture can be used within any holographic app.
The bloom gesture

- Bloom is a gesture used to go back to the Start Menu. It is similar to pressing the Windows key on a keyboard or the Xbox button on an Xbox controller.

- To do the bloom gesture, hold out your hand, palm up, with your fingertips together. Then open your hand.

- In Windows Holographic, the bloom gesture can be performed with your hand. You can also return to Start by saying "Hey Cortana, Go Home"
HoloLens Hands On
Round Table Discussion

1. What will be the advantages and disadvantages of VR/AR use in education?

2. How will you measure students’ knowledge retention?

3. How do you facilitate learning abstract content?

4. Which tools will you use to create VR learning experiences?
Credits - Images

https://aotw-pd.s3.amazonaws.com/Audi_AR_Kalender_h264-big.jpg