Virtual Reality and Augmented Reality- Getting Started

When you look around you right now, that is pure reality. (We're going to completely ignore any existentialism, quantum mechanics, philosophy, and psychological discussions). Today, there are 2 different types of computer generated realities that we will be exploring: augmented reality, and virtual reality.

What is Augmented Reality (AR)?

Augmented Reality is an enhanced version of reality created by the use of technology to overlay digital information on an image of something being viewed through a device (as a smartphone camera). (Webster Dictionary). Augmented reality is normally generated as you hold your phone camera over an enabled paper, card, or poster. You will need to access the Augmented Reality through specialized apps.

If you're looking through a screen and a computer is adding something to that physical space that is NOT there when you move your eyes from the screen, THAT is augmented reality. Let's use the most popular (and best) use of this technology right now.

This picture does a good job of establishing a couple of principles to keep in mind with Augmented reality:

- The user's perspective is still grounded in the real world.
- The device only generates a portion of the environment on the screen – in this case, an electric rat
- The interactive component here is the pokeball and the pokemon, both of which respond to user input

What is Virtual Reality (VR)?

Virtual Reality is defined as the computer-generated simulation of a three-dimensional image or environment that can be interacted with in a seemingly real or physical way by a person using special electronic equipment, such as a helmet with a screen inside or gloves fitted with

sensors. (Webster Dictionary). Virtual Reality uses images (either real or computer generated) usually presented in a panoramic view to portray the effect of being in a three-dimensional world. You do need specific apps and equipment in order to use this technology.

Virtual Reality, ditches the first two principles of AR. Here, the user's perspective is NOT grounded in the real world and instead of just a portion of the screen displaying a computer generated image, now that image is full screen.

Let's switch AR off in Pokemon Go.
You'll notice the background is not making use of the device's camera. Everything is supplied by computing power, and the user's perspective is not grounded in their real location.

This is virtual reality at its most basic: a world created completely by a computer that you are either a passive viewer in or an active participant.

Most references to VR include not just a computer generated world, but immersion in these worlds. This is done by fully engaging your sense of sight, sound, and sometimes touch, through the use of a headset, goggles, etc. This fully removes the aspect of your perspective being determined by anything that actually exists.

What tools do you need to implement AR and VR in your classroom?

The tools you will need in the classroom will depend on the level of interaction that you want your students to have with AR or VR.

To participate in an AR world, you will need:

- An iPod, iPad, or Smartphone with a camera and internet connection

This is needed so that you can hold the device over an image to activate the Augmented Reality scenario.

- Apps with Augmented Reality components built into them.
- An image that triggers the Augmented Reality apps to activate.
- An internet connection

To participate in a VR world, you will need:

- An iPod or Smartphone with a camera and internet connection

This is needed so that you can see the Virtual World

- Apps with Virtual Reality components built into them.
- Headsets to hold your iPod or smartphone

There are several different types of headsets to use- more about that later

- An internet connection
- Headphones or speakers if the virtual world has sound
- Controller if the virtual world can be modified through touch or movement

Recommended Devices for AR and VR

iPod/iPad

As long as your iPod has a built in camera and can run the latest iOS, you will be able to use it for VR and AR. An iPad will work for AR, but is too big to fit in the VR headsets.

iPhone

The Apple App Store tends to have the widest selection of VR and AR apps

Android Smartphone

Google first developed its VR applications for Android devices, including its Google Expeditions for education. If you do have an Android device there are several options of high quality VR and AR aps.

Popular Headsets for VR

The most expensive options include a powerful PC and an Oculus headset, but these are far from what is required – you can have a pretty decent experience with just a mobile computing device and an inexpensive headset.

Google Cardboard- This is the cheapest option for VR headgear. There are several different models on the market ranging in price from about $5 to $10. Some come with straps to hold on the cardboard and some do not. Most you will need to assemble yourself. We have found these to be very flimsy and they do not hold up well if several people are using them.

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Viewmaster- This is also a relatively inexpensive option for VR headgear and normally runs around $20. These hold up to much more use and while they don't come with straps to hold them to your head, you can buy straps on Amazon for another few dollars.

Samsung Gear VR- These headsets run about $100 are an entry level headset used for gaming. The difference between these headsets and less expensive models are the comfort of the fit as well as the ability to manipulate how far the device is from your eyes which enhances the viewing of the 3d world.

HTC Vive- This headset is about $800 and can be purchased as a set that includes speakers and controllers for about $1500. This can also be purchased as a set that includes a computer tower to run VR software for about $2500.

Explore- Some AR apps that we love!

Aurasma- This is a product that you can use to create your own AR experiences. Use a computer for creation, then a mobile device to activate your Aura. https://www.aurasma.com/

Layar (Android, iOS) – This product also allows you to create your own AR experiences in print sources such as posters, papers, advertisements, and more. This tool allows you to bring print to life by adding videos, web links, and an alternative view of the print. https://www.layar.com/

Star Chart- When Star Chart is opened on your Android or iOS device and pointed at the sky, the app will inform you of what stars or planets you're currently facing, even during the day when the stars are at their hardest to see. It does it all in real-time, too. https://itunes.apple.com/us/app/star-chart/id345542655?mt=8

Quiver and Quiver Education- Color the downloadable pages and bring your drawings to life! Sign up for their education portal which is a work in progress. http://www.quivervision.com/

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Elements 4D- Chemistry blocks that help you learn. Element 4D helps students learn the Periodic Table by using a set of interactive blocks. This app shows the students how elements can combine to make chemical substances. http://elements4d.daqri.com/

Explore- Some VR apps that we love!

Viewmaster - The modern version of your favorite childhood toy. The viewmaster apps are sold much like traditional software: you buy a content package compatible with the viewmaster hardwate that focuses on specific activities and locales. Current packs include visits to space, the African Sahara, underwater shipwrecks, and dinosaur herds. http://www.view-master.com/en-us

Discovery VR – Hosted by the Discovery Channel, this app allows you to get an immersive, first-hand look at real life events, scenarios, and locations by dropping you into panoramic videos. Updated regularly, many of the featured scenarios align with Discovery Channel programming and coverage of things like Shark Week, Mythbusters and, of course, the Puppy Bowl. http://www.discoveryvr.com/

Hidden Worlds of the National Parks – An offering by various US National Parks in conjunction with Google, this website allows you to walk in the footsteps of a park ranger to explore popular national landmarks shot in beautiful high-definition video. Not only visually stunning, but particular attention has been paid to ensuring the vast amounts of flora and fauna are represented with immersive audio. https://artsandculture.withgoogle.com/en-us/

NY Times VR and ABC News VR- Like other offerings on this list, the NY Times and ABC News apps features panormamic videos and pictures to drop the user into eye-catching and moving experience. Where these app differ from those above their focus on world events, with many of the VR offerins mirroring major stories and headlines. http://www.nytimes.com/marketing/nytvr/

http://abcnews.go.com/US/fullpage/abc-news-vr-virtual-reality-news-stories-33768357

Google Expeditions – One of the most exciting apps, in our opition, Google expeditions allows you to simply and easily lead a troop of explorers on virtual expidentions to various places of cultural and historical significance and provides key pieces of information about eese places right within the app. The best feature here – and what sets it apart from the others – is the ability of the leader to point to various places in the panoramas and see exactly where students are looking, all in real time.

https://www.google.com/edu/expeditions/

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