
Virtual Reality Technology

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Virtual reality as a technology has been around for a quite a while. As far back as the 80s and 90s, discussion existed about the possibility of virtual reality. Anand Timothy (2016) surmises that due to missing immersive experience that was expected and the rise of the internet, virtual reality almost went away. In most cases, high overhead cost was seen as a discouragement towards the use of virtual reality. However, there is starting to be a push towards virtual reality; whether in film, video games, and even education.

So what is virtual reality?

Virtual Reality Technology

Virtual reality is the term used to describe a **three-dimensional, computer generated environment** which can be explored and interacted with by a person. That person becomes part of this virtual world or is immersed within this environment and whilst there, is able to manipulate objects or perform a series of actions.

Skylar (2007) opines, “today’s students are proficient in using technology; 90 percent of children in the United States between the ages of 5 and 17 use computers on a regular basis. It stands to reason, therefore, that integrating VR technology into lessons would improve student motivation and engagement” (p. 55).

Cobb County Schools Technology Vision

One of the goals of the Cobb County School District's Technology Division is to “assist teachers with using technology effectively for assessing student learning, differentiating instruction, and providing rigorous, relevant, and engaging learning experiences for all students” ([Cobb County Schools Technology Division Strategic Plan](#)).

For Consideration:

- 1) How does Virtual Reality Technology support this goal?
- 2) What types of Virtual Reality Technology can be feasible and sustained at the local school level?

Teaching, Learning, & Assessment

Virtual Reality Technology can be used in many different content areas. Student's can take virtual trips or tour museums. This can be especially useful in Social Studies with the Geography domain. Student's can also get real - world experience in a virtual setting in a number of fields.

Reid and Sykes surmise that “traditional methods often relegate students to a passive role in the classroom. This is contrary to the wisdom that learning is much more effective when it is an active discovery process. Similarly, new teaching methods and technologies must be pioneered to relieve teachers of the growing burden placed upon them by today's classroom and its changing role in society.” Virtual Reality is the strategy that brings lessons to life.

Awtrey Middle School: Pilot Example



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Awtrey Middle School serves grades 6 - 8 and has around 836 students. The age of students range from 11 - 14. 35.8 % of students are receiving a free or reduced lunch. Awtrey has the benefit of available technology as well as school support for bringing your own device (BYOD). It is common to walk in any classroom and see a student with a smartphone. That being said, we must find ways to engage our students by using this technology in our instruction.

Utilizing the available technology that we have will make Awtrey a great candidate school to demonstrate the use of virtual reality in the classroom, but where should we begin?

Virtual Reality Technology: One Possibility: Google Expeditions and Cardboard

Google cardboard has been seen as a game changer in the virtual reality for education world. Virtual reality equipment had been seen as too expensive; however Google Cardboard takes inexpensive equipment and the technology that the student already has to combine with Google Expeditions and create a virtual experience that students could not have nor afford only a few years ago.

Virtual Reality Technology: Google Expeditions and Cardboard

Using the paper and writing utensil provided, after you watch the video, do a quick write of how many ways this can be useful inside the classroom within different content areas.



Google for Education. (2016, May 19). Google Expeditions. [Video file]. Retrieved from:

https://www.youtube.com/watch?v=3MQ9yG_QfDA

Google Expeditions and Cardboard: Field Trips

As a Social Studies Teacher, I can see possibilities of being able to use this in the classroom and allow students to go to those remote places that they have to learn about, but not be able to see in real life.

Compare and contrast the levels of engagement from the video with current practice.

For a view of some current expeditions, notice the following link: <http://tinyurl.com/jnf6zxx>



Google for Education. (2015, May 28). Google Expeditions. [Video file]. Retrieved from: <https://www.youtube.com/watch?v=mlYJdZeA9w4>

Differentiation and Higher Order Thinking Skills

Differentiation: If you had the opportunity to take a look at some of the field trips, there are many ways to differentiate material and focus on higher order thinking skills. The true nature of the experience has now given the teacher the ability to differentiate material by process and by learning environment. Students can now experience what it would be like to be on top of Machu Picchu and truly describe how what the Inca saw. They could also think more elaborately on the difficulty it took to build on the sides of mountains. This a far change from textbook understanding.

Imagine standing [here](#)



Image retrieved from:

<https://pixabay.com/en/photos/machu%20picchu/>

Equipment and Software Needed

Kits can be purchased directly through a program partnered with Best Buy or we can make our own kits. Expedition's website says that: "Expeditions will run on any Android (4.4 and above) or iOS (8.0 and above) device, but multiple devices are required to use the app. The phones used with a virtual reality viewer need to meet the required specifications" ([Google Expeditions](#)).

Required specifications:

- A gyroscope and accelerometer: This is essential for determining orientation and doing head-tracking in virtual reality viewer.
- Android 4.4 or later OR iOS 8.0 or later
- 1GB ram

Equipment Cost and Potential Funding

Best Buy has kits that are already assembled and include the devices for the teachers and the students along with a service plan. I have included those figures in a handout on the desk and screenshot it on this page. We can consider that and even make use of [DonorsChoose](#). However, a more fiscally, feasible plan is to purchase the Google Cardboard and use the student's personal devices along with the tablets that we have already at school. The issue with going that way is being certain that student devices meet the required specifications.

Remember, other virtual reality equipment is quite expensive. This example allows us to see the impact of the technology in a less expensive way.

Google Expeditions Kits



PRE-REGISTER TO GET YOUR KIT

FOR 30 STUDENTS

- 30: Student Devices
- 30: Mattel View-Masters®
- 3: Sabrent Rapid Chargers
- 1: Insignia™ Teacher Device
- 1: TP-Link Router
- 1: Pelican Case
- Geek Squad® White Glove Service

Bundle Price: \$9,999¹



PRE-REGISTER TO GET YOUR KIT

FOR 20 STUDENTS

- 20: Student Devices
- 20: Mattel View-Masters®
- 2: Sabrent Rapid Chargers
- 1: Insignia™ Teacher Device
- 1: TP-Link Router
- 1: Pelican Case
- Geek Squad® White Glove Service

Bundle Price: \$6,999¹



PRE-REGISTER TO GET YOUR KIT

FOR 10 STUDENTS

- 10: Student Devices
- 10: Mattel View-Masters®
- 1: Sabrent Rapid Chargers
- 1: Insignia™ Teacher Device
- 1: TP-Link Router
- 1: Pelican Case
- Geek Squad® White Glove Service

Bundle Price: \$3,999¹

Image retrieved from:

<http://tinyurl.com/jqk7svg>

Google Cardboard

[Google Cardboard](#) is the virtual reality headset that can be used with Google Expeditions. Students can choose the style and price that fits them best. It could even be a project for art students at the school to create these headsets. The link above shows the different styles and prices



Google Cardboard: How it works! Retrieved from:
<http://www.youtube.com/watch?v=SxAj2lyX4oU>

Technical Support

Cobb County School District have many Technology Training Integration Specialist (TTIS) within the different school buildings to help integrate virtual reality programs in the classroom. However, many programs such as the Google Expeditions program only require knowing how to download the App and making sure that required specifications for networking are met.

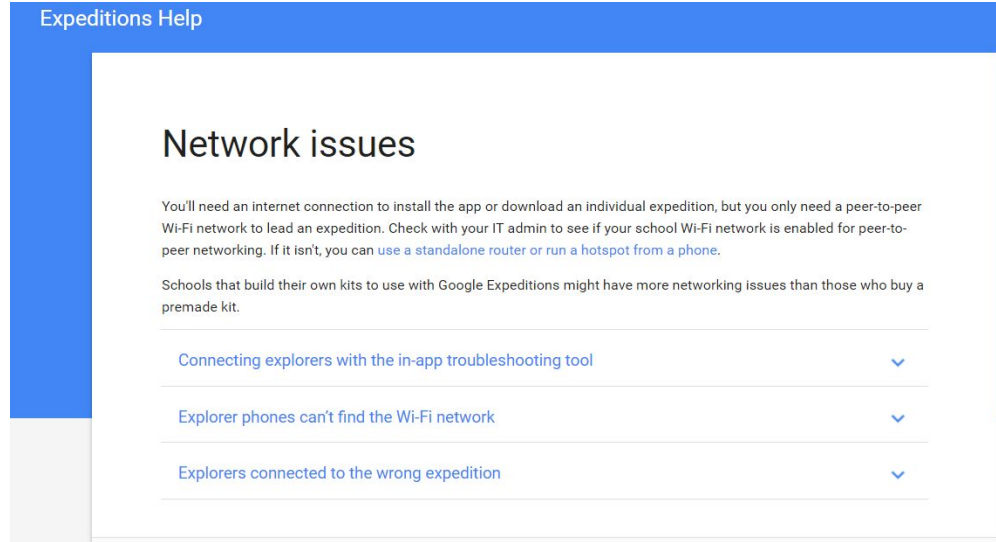


Image retrieved from:

https://support.google.com/edu/expeditions/answer/7035113?hl=en&ref_topic=6298098

Limitations, Ethical Issues, and Equitable Access

During my research, I did not run across any limitations or ethical issues. To better understand, visualize this as being an actual field trip. Limitations exist if students do not have the required specifications on the device or access to devices. This would be similar to students not having money to go on an actual field trip. Of course, purchasing the assembled kits will ensure that this is not an issue. The cost of virtual reality equipment can also be seen as a limitation, but if we really want to increase student engagement; then we will consider the examples in this proposal. Students are guided through the field trip tours much like on a physical field trip. The teacher would be like the tour guide and would determine what the students can and cannot view. Digital citizenship aspects such as teacher giving creative credit to the tours used should be reviewed.

Research

The research shows that virtual technology can bring real world connections to things that students learn about. Meyer (2016) includes the viewpoints of teachers that used different forms of Virtual Reality; including Google Expeditions.

Hector Camacho, an economics teacher, developed an expedition touring some of the nation's major financial centers. Camacho states, “what I found so surprising, that just being in the physical place 24 or virtually being in the place could be so impactful on their understanding of what this all means” (p. 24,25).

Communication and Collaboration

Virtual Reality Technology promotes communication and collaboration because of the immersive nature and real world connections that can be made. Students are able to connect with field professionals, describe their experience with the technology, and compare and contrast those experiences. NASA for example offer virtual visits, as it continues to connect and collaborate with schools across the country. As virtual reality technology continues to improve in education, think of ways that we as a school can offer our input.



Image retrieved from:

<https://www.flickr.com/photos/gsfcr/5756268082/>

Diversity

Skylar (2007) states that virtual reality technology can be useful for students with disabilities. Students that have ADHD or EBD often have lower levels of engagement. These same students also spend much time in the virtual reality setting playing video games. “It seems logical, therefore, that incorporating VR into lessons would increase student engagement and motivation, thereby increasing the learning and possibly improving the behavior of students with ADHD and EBD” (p. 57). Skylar also suggests that teaching social and coping skills to EBD students in a virtual setting will help to increase generalization of those skills.

Diversity: Assistive Technology

Other benefits of VR include helping students that are deaf and hard of hearing. Passig and Eden (2000) opine that “one of the most simulative, innovative, and attractive tools for enhancing thinking available today is VR technology” (p. 279). They further state that “it allows the user to become an active part of the environment and to benefit from interactive communication without using words. VR is able to convert the abstract into concrete by giving perspectives on processes that are impossible in the real world” (p. 280).

The possibilities of increased engagement for our students with diverse needs is limitless.

Professional Learning and Diffusion of Innovations

Google offers certification and that is just one way that our staff can be ensured to learn about Google Expeditions.

[Google Expeditions about page](#) suggests just starting. I suggest starting on a grade level. I currently work with 7th grade teachers on implementing technology and would be very interested in piloting this program within the Social Studies classroom and filtering it throughout the grade level.

Continuous Learning

As new virtual reality tools come out, it will be imperative that we research the effectiveness of these tools. The Google Expeditions and Cardboard is only one example and it will be interesting to see if this inexpensive form of virtual reality increase levels of engagement. I will also challenge teachers to see what they can do as far as creating virtual tours and finding new uses for this type of technology across the different content areas.

Reflection

I believe that deciding whether a technology is emerging is dependent upon the exposure that people have with that particular piece of technology. Some things are quick to becoming outdated, however, new uses can make what once was outdated, innovative. Virtual reality technology can provide many different students real world exposure to a number of different fields. We only explored in depth its use as a way of taking virtual field trips.

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Google for Education. (2016, May 19). Google Expeditions. [Video file]. Retrieved from:
https://www.youtube.com/watch?v=3MQ9yG_QfDA

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