

AR/VR Technology – LTEC 5310

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At the 2018 Consumer Electronics Show in Las Vegas in January, I heard a reporter comment that if you weren't showing AR/VR technology you might as well not be exhibiting there this year. Clearly they are pushing AR/VR products. Although they were introduced a number of years ago, AR/VR has not yet "crossed the chasm."

So what is it about AR/VR that makes them such an interesting technology? In this assignment, I would like for you to examine this new technology.

Part 1: Based on current literature, identify and explain 3 features of AR/VR that improve the user experience. (Maximum length – 1.5pages double spaced)

Both AR/VR improve the user experience in many ways. The early adopters in the business world have gained benefits such as reduced errors, improved efficiency and more efficient use of labor. Three features that improve the user experience are *visual engagement*, *mobility* and *cost savings*.

Visual engagement is one of the best features in the user experience for both AR/VR. Everyone from stores, real estate agents, and others use visual engagement as a main feature to pull in the end users to use their products and services. For example, IKEA is now using an AR application that you can engage with inside your own house (Schneiderman, Plaisant, Cohen, Jacobs, and Elmqvist, 2017). After you download the app, you can hold up your mobile phone to the room you want to design, select their furniture you'd like to put into the room, and it visually shows you what the furniture looks like inside of your room. Talk about engagement being taken to the next level! Many interior designers can now use apps that will allow them to design a room without having to bring in the materials. They can select different colors palettes, furniture, curtains, tile, and carpet to virtually design a room using AR.

Mobility provides a great user experience within AR/VR. VR apps allow buyers of real estate to walk through their site without being physically present there. Also, in the education space you can take students to where they need to go without having to travel. Bringing the learning environment to them through the virtual world is a game-changer for places that are difficult to travel to, or almost impossible due to the environmental constrictions. For instance, the Egyptian Temple was recreated in 3D for an

educational class. The students were able to walk around the environment without leaving the classroom. This is one of the many possibilities that the modern technology can bring to education (Fluper, 2017). Another example is that a company called Media Studio implemented the method of immersive learning in its various educational projects. In one project students were able to immerse themselves in a seabed environment to learn marine biology and work with a tablet in which the teacher activates scenarios that students can see through virtual reality glasses. There are no books used, and all content is within the VR technology.

Cost savings is a big feature that will improve the user experience. As much as AR/VR can get costly, in many instances it is much cheaper for the AR/VR software and hardware than actually experiencing the true environment. In instances where it's too expensive to travel to experience the environment, or in training simulations, AR/VR can bring huge cost cutting benefits to the end user or your business. An example of this is Airbnb says virtual reality can be helpful when you're living in an area where you can't travel to view your hotel or real estate before you purchase it (Stokes, 2017). Airbnb explains that VR can be used to get a better view of the house or room you will be staying in even before you actually book it. Not having to travel to see the room or house in person is a huge cost savings. VR/AR can also enhance training for real life environments by creating a simulation of reality where people can practice beforehand (such as flight simulators for pilots, or a human body for surgeons). It is much cheaper to simulate flight or space operations for training purposes, than to use the aircrafts themselves. In healthcare you can now simulate surgery for training purposes. A virtual body will allow a surgeon to practice using VR glasses, which allows them to practice as many times as needed without using a human body.

Part 2: Likewise, identify and explain 3 key challenges that need to be overcome by AR/VR technology in order to be universally accepted. (Maximum length 1.5 pages double spaced)

There are many challenges right now that the AR/VR technology needs to overcome to be universally accepted. The three main challenges that have consistently been listed through research are *social rejection*, *functionality*, and *cost*. Not only is the hardware and glasses not cool to walk around town with, but it's also expensive.

Social rejection is a big problem with VR and AR technology. Most people in mainstream society aren't going to walk around wearing a big plastic or cardboard headset on the street (plus with VR that would be dangerous). Although most believe that VR and AR are both very cool technology, it is still not socially accepted to be wearing "headset gear" walking around town or pointing your phone at people using AR technology. Although VR opens up potentially unlimited virtual worlds, it's a spatially restricted experience as far as the user is concerned (McLellan, 2016). The headset gear that is needed for VR is bulky and restrictive. Much smaller and less immersive VR apps via smartphone-based systems such as Google Cardboard and Samsung's Gear VR are available, however you're hardly likely to walk down the street wearing cardboard glasses or cheap plastic headgear. The first company that can master AR glasses that are fashionable and functional will lead this industry. Think Harry Hart and Eggsy in the movie "The Kingsman". Fashionable and very cool! People will even pay money if they can get that type of quality and look good using it.

Functionality is another reason AR and VR aren't accepted by everyone. VR needs to be more than a gaming system to succeed. Non-gamers are struggling to find use for the technology. For instance, very few industries have found uses for the technology. Companies like Magic Leap (Schumacher, 2017) are trying to open up the value of VR by using augmented reality (AR) features that tie the experience to the real world. The technology has clear lenses that project images over real objects. AR is a great idea, but there aren't many companies developing these concepts. Virtual reality is

in the same spot. To reach consumers the companies producing them need to answer for the “non-gamer”, what’s in it for me. By looking at how the technology can improve someone’s life, or make them more entertained, then they will find more mainstream adopters. Right now, it’s not functional for everyday life needs.

Cost is probably the biggest concern for the majority that want to purchase quality AR and VR technology. Most people carry smartphones, and the technology is either not very good, or very cheap. AR and VR both have high requirements in terms of processing power and graphical factors in order to work well (Ranjan, 2016). They need to be able to measure, track, project and anticipate movement with zero latency. This is one of the main factors that hardware costs remain high. More sophisticated AR also requires the ability to anchor, track, follow and adjust movement throughout an environment at scale. This requires sophisticated sensors, the ability to measure depth reliably, and battery and processing power. For mass consumption, this all needs to fit into a small, affordable frame. Most decent headsets and software start at a minimum of \$800 and go way up from there.

Part 3: In your opinion, in what year do you think AR/VR will be as universal as HD TV or smartphones are now and why? (Maximum length-1 page double spaced)

We are still 15-20 years from AR/VR being universally accepted. Not only does the technology need to meet the needs of the mainstream, the cost needs to come down while the functionality increases. Think of getting rid of your mobile phone in place of stylish glasses. Glasses that nobody realized were any different than you're regular every day glasses but had the functionality of your mobile phone. And not only that, they have to stay charged for a long time without removing. This is one reason I don't think this will happen in the next few years.

To do this effectively the processing systems need to become micro-sized, but still run the software similar to a mobile phone. No matter how good VR gets, few people would be comfortable socializing in person with someone whose eyes they can't see, and social acceptability is an absolute requirement for anything we wear in public (McLellan, 2016). Once we wear it in public, it would officially be considered "mainstream." Though VR has the ability to connect people all over the world in more-immersive ways than ever before, those bulky headsets are not appealing. Major VR manufacturers are already preparing their users for the day VR is indistinguishable from AR. They are looking to take the thick plastic headsets and make them stylish, clear lenses projecting virtual worlds, with the option to block out reality completely in favor of an immersive experience. Standalone VR is the next step, removing the PC (or the smartphone) from the equation entirely.

Facebook's head of research, Michael Abrash said "Twenty or 30 years from now, I predict that instead of carrying stylish smartphones everywhere, we'll wear stylish glasses. Those glasses will offer VR, AR and everything in between, and we'll wear them all day and use them in almost every aspect of our lives. The distinction between AR and VR will vanish." (Conditt, 2017)

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