The Impact of Virtual Reality in Today's Word

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Virtual Reality (VR) has become increasingly popular over the past few years. It gives people an escape from their day to day life, and brings them to a whole other world. Today, virtual reality headsets are being used by people all over the world for gaming, education, and medical purposes. Virtual reality immerses users in a three dimensional sensory environment of their own choosing.The more deeply users can immerse themselves in a VR environment -- and block out their physical surroundings -- the more they are able to suspend their belief and accept it as real, even if it is fantastical in nature. (Sheldon, 2022) It also uses different items such as interactive headsets and body suits to experience the VR simulation at a deeper level. The advanced technology that is used to create the virtual world has motion sensors implemented into the headgear or bodysuit that picks up the user's surroundings, and adjusts according to what setting you are in. There are 3 different types of VR technologies: Non-Immersive Virtual Reality, Fully Immersive Virtual Reality, and Semi-Immersive Virtual Reality. (Atria Admissions Team, 2022) Fully-immersive virtual reality’s display typically splits between the user’s eyes, creating a stereoscopic 3D effect, and combines with input tracking to establish an immersive, believable experience. (*The 3 Types of Virtual Reality – Heizenrader*, 2023) Non-immersive virtual reality refers to a virtual experience through a computer where you can control some characters or activities within the software, but the environment is not directly interacting with you. (Sultan, 2023) Semi-immersive VR allows users to interact with the virtual environment but doesn’t require any physical interaction.

Virtual Reality History and Gaming:

One of the first attempts at virtual reality happened in the mid 1950s. Cinematographer Morton Heilig invented the Sensorama Simulator, which can be compared to many modern arcade game machines. It was a cabinet-like booth that had a max capacity of 4 people. The sensorama used a stereoscopic-3D screen, stereos, color display, and a vibrating chair, and was programmed with 6 featured scenes that users were able to choose from. The goal of creating this machine was to not only to visually entertain users, but to enhance their other senses as well. In 1968, the first head-mounted virtual reality display was invented by computer scientist Ivan Sutherland and his student Bob Sproull (Law, 2022). This device was known as the Sword of Damocles, and was connected to a computer that allowed users to see a wider display when they turned their head in a different direction. In 2010, the first prototype of the Oculus Rift was released. The Oculus Rift was invented by VR enthusiast Palmer Luckey, who later went on to found Oculus VR with Brendan Iribe, who became CEO. (Pritchard et al., 2022) In 2014, Mark Zuckerburg, the CEO of Facebook, bought the Oculus Rift for $2 billion dollars. (Haselton, 2017) He decided to buy the product because he believes that virtual reality could be the next major technological advancement. Zuckerburg said while announcing the deal "Imagine enjoying a courtside seat at a game, studying in a classroom of students and teachers all over the world or consulting with a doctor face-to-face — just by putting on goggles in your home. This is really a new communication platform." (Yarow, 2014) The Oculus was later discontinued and was reinvented into the Meta Quest VR headset that was released on October 10, 2023.

When people think of video games today virtual reality isn’t always the first to pop into people;s heads. They often think of the popular Playstation or Xbox consoles. Virtual reality has been introduced into the gaming world and is advancing more everyday. In 2016, Sony released a virtual reality headset that is compatible with the Playstation 4. It induces 360-degree vision which allows you to feel “inside” the videogame world, 3D audio that allows you to judge the distance of the sound you are hearing, and a built-in microphone which allows players to interact with their online friends. (*PlayStation VR | Live the Game With the PS VR Headset*, n.d.) Along with the headset, players can buy Move Motion controllers that are linked to the headset which allow users to be more in touch with their surroundings. The PS VR game controller also goes hand in hand with the motion controllers and allows users to aim correctly and emits vibrations when using weapons in games. (*PlayStation Move Motion Controller (US)*, n.d.) Lastly, Nintendo released 2 different VR headsets known as the Nintendo Labo and the OIVO VR headset. Both of these devices are compatible with the Nintendo Switch controllers and have a wide variety of games for consumers to choose from.

Virtual Reality: Education

Not only has virtual reality had an impact on the gaming industry, but also on the education system. The use of virtual reality has become prevalent not only inside the classroom, but used during online teaching courses as well. In an article written by Kiara miller, she writes 5 ways virtual reality benefits teaching. It increases engagement, helps offer immersive learning experiences, is associated with a higher retention rate, it caters to experiential learning, and it is all inclusive (Miller, 2022) Many students around the world have a hard time concentrating during lectures, which often causes them to fall behind or fail. More recently, schools have been incorporating virtual reality use in their lesson plans, which has made great impacts on student learning. S. Piovesan et. al states “According to Clark (2006) Virtual Reality can be used to make the learning more interesting and fun with the purpose of improving the motivation and attention, decreasing costs when using the objective and the real environment no matter how expensive the simulation is.” (Piovesan et al., 2012)

Along with this, studies have shown that use of virtual reality in the classroom has benefited students’ academic performance.Virtual reality technology is used in many educational fields such as aviation, military, architecture, mathematics and science and increases the quality of education (Bayraktar & Kaleli, 2007 as cited in SARIOĞLU1 & GİRGİN, 2020). In March 2020, a study was done on 6th grade students to test their attitude towards school and their academic achievement. To test their hypothesis, they used different research methods and the Cell Knowledge Test that was created by the researchers. As a result of the research, it was concluded that the use of virtual reality technology in the cell subject teaching has a significant effect on students' achievement and attitudes towards the course. (SARIOĞLU1 & GİRGİN, 2020).

Not only has Virtual reality made an impact on subjects such as math and science, but also in history and social studies. VR allows students to travel places they thought they would be able to see, right from the classrooms. For example, students would be able to travel into space and see Earth as if they were actually right in front of it. They would also be able to travel to different countries and look at cultural and historical monuments all over the world. In 2018 Mary Michelle Bowen conducted a study that assessed the effect of virtual reality on middle school students’ social studies courses. (Bowen, 2018, 1) The students were required to download the Google Expeditions app on their smartphones in order to go on their “field trip”

their teachers chose. Through the experience of field trips, students can make meaningful connections to the content and internalize the concepts, because they are experiencing the content in a *real world* (Gautam et al., 2018 as cited in Bowen, 2018, 21). Oftentimes many schools cannot afford to send their students on field trips due to things such as budget cuts, there isn't enough school funding etc.

Virtual Reality in the Medical Field:

The Healthcare system has also been greatly impacted by the use of virtual reality. Everyday technology is advancing and is changing the future of surgeries and telemedicine. In healthcare, practitioners are exploring exciting ways that VR can assist patients and health providers to achieve better treatments and outcomes, including in surgery, pain management, physical and cognitive rehabilitation, mental health, and more. (Li, 2022) Surgical residents have used virtual reality to practice performing different surgeries, and gain another perspective of surgical training. Residents using virtual reality allows them to be more focused on perfecting their surgical skills, until they are ready to move onto a real patient. This allows patients to be kept safe as well as helps residents gain confidence in their skill. Recently, Vr is being used primarily by orthopedic surgery residents. Laith K Hasan et al. (2022) stated current applications of VR in resident training include arthroscopic simulators, fully immersive operative simulations (eg, trauma management, arthroplasty), bone drilling haptic simulators, and reconstruction simulations.(p. 2) .

In recent years, more and more surgical residents and surgeons have used virtual reality in their practice and have benefited greatly from it. Surgeons need to constantly practice their skills and using new advanced technologies have been proven to help in many ways. Dr Cory Caledine, Bone and Joint Institute of Tennessee stated "A 2019 study conducted by UCLA's David Geffen School of Medicine found that the surgical performance using Osso VR's platform improved surgical performance by 230%." (Siwicki, 2022) The Osso VR Service Osso VR is a surgical training and assessment platform that gives medical device companies and healthcare professionals radically better ways to share, practice and learn new skills and procedures. (Jacobson et al., 2021). "Subsequent findings by researchers at the University of Illinois College of Medicine at Chicago – which conducted a randomized, blinded validation study using the Osso VR platform – found that use of virtual reality for surgical training significantly increased procedural accuracy and completion rate, which more than tripled the odds of completing a procedure successfully and demonstrated a 300% improvement in accuracy when residents trained in the Osso VR module."

Many people, especially teens and young adults, enjoy video games and play them frequently. Along with playing video games for enjoyment, people also play games to cope with their mental health. In today’s society, the number of people struggling with depression, anxiety, and suicidal thoughts has increased after the coronavirus pandemic. (Duszynski-Goodman, n.d.) In a study done by Federica Pallavicini and Alessandro Pepe, they found that the use of virtual reality games could boost positive emotion and lower feelings of anxiety. During the study A total of 36 young adults played a low body-involvement (ie, *Fruit Ninja VR*) and a high body-involvement (ie, *Audioshield*) video game in virtual reality. The Visual Analogue Scale (VAS) and the State-Trait Anxiety Inventory, Form-Y1 (STAI-Y1) were used to assess positive and negative emotions and state anxiety. (Pallavicini & Pepe, 2020) After conducting their experiment, based on the participants' responses they concluded there was an increase in feeling of happiness and surprise, and a decrease in feelings of fear and sadness.

In conclusion, Virtual Reality has changed the future of technology. Some of the new advancements added to VR technology were immersive educational experiences, The advent of hyper-realistic virtual reality, the expansion of social VR platforms, the integration of AI in virtual reality, and the adoption of Vr in the business world. (*Top 5 Virtual Reality Trends of 2023 — The Future of VR*, 2023) While these are only predictions of what is yet to come, unthinkable achievements are being made every single day. The gaming industry has expanded to a whole new world of possibilities, and has become a valuable piece of technology many people want. ALl over the world VR technology has impacted students and teens not only in terms of entertainment, but education and academic success. The usage of this technology in healthcare has helped many patients all over the world. Many patients are struggling with post-traumatic stress disorder and other mental illnesses, and the feeling of immersion in a different environment, leaves them feeling uplifted and boosts happiness. It also allows patients to become exposed to their phobias and stressors in a safe and controlled environment, leaving the patient out of harm's way. (*Top 5 Virtual Reality Trends of 2023 — The Future of VR*, 2023) Although many people may not realize, VR technology is being implemented in all fields and will continue to change. Virtual reality has made a lasting impact on today's world.

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