



SHORT COMMUNICATION

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New Normal: Medical Training through 360 Virtual Reality – in Times of COVID-19 & Beyond

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Virtual Reality (VR) introduces instructions, procedures, & protocols that will be the new normal for medical training & education.

VR Benefits to Medical Education & Training

Virtual Reality can be used to greatly enhance student/physician learning and completely transform the way education is delivered. It works on the basis of becoming completely immersed in what you are learning. This deep dive into the subject motivates the trainee, helps them understand the concept or procedure completely. It also requires less cognitive load to process the information as this is naturally how we perceive the world around us, not on a 2D computer screen or from a lecture.

- Cost-effective training solution
- Watch as a real-life situations & instruction
- Viewers are fully immersed in what they are learning
- Improved concentration on the subject matter
- No distractions or interruptions
- Viewers can replay & repeat as needed
- Requires less cognitive load to process the information
- Viewers are much more engaged in what they are learning
- Educators can create conditions, situations, & possibilities

Another benefit of VR in medical education is the ability to track such metrics as how long the student was in the experience or what exactly where they looking at. These visual analytics of what a student was looking at during the experience are called Heatmaps. Extremely valuable information for the educator.

VR training is quite inexpensive compared to when you consider the alternative of attending a conference or visiting a skilled doctor's office. Cost to travel, time away from your own practice, potential exposure to covid-19 all add up. Lowering the cost of high-quality medical training thereby lowers the barrier to entry for physicians to learn new procedures and expand their services. Everyone benefits from better educated doctors.

This is not to say that VR will completely replace the live-in person training. No matter how many times you visualize something it is not the same as doing it. However, certain skills and knowledge quickly becomes a second nature reflex allowing for the cognitive mind to focus on other variables when in the real-world training scenario. Take astronauts for example. They you can just go to the moon and train. They are sent to extensive visual and experiential training before they ever set foot on the moon. This is how VR will transform the flow of training in the medical world.

How Does vr and 360° vr Work and What's the Difference?

While VR technology has its place in the industry and it works with computer graphics and sensors, 360° VR supports live action 360° videos for the purpose of training. While today's computer generated graphics in a VR world are good, they are no replacement for the actual thing. Listening to an avatar discuss a complex procedure does not have the same impact that hearing the information directly from the mouth of the expert. In addition, companies like Med360 have developed technology to allow for synchronized playback of the 360° video content, with a live host to control multiple viewers allowing two-way communication between viewers and expert. The viewers can then repeat and playback the content later for as many times as they like. It is also important to point out that 360° video content can also be completely interactive in the same way as an artificial VR world. Pop-up information called hotspots can be added to any 360° immersive video. This information can include things like text, images, links, and quizzes.

VR in Times of COVID-19 & Beyond

Pre-COVID-19, 8-10 students might all cram into an operating room to view a specific procedure. Only 1 or 2 students can peek over the shoulder of the surgeon; get a firsthand look; see what's actually being done, able to observe only what they can see. And this is also the case with standard 2D video content. The student is at the mercy of what the cameraman decided was important to see that day. Now, due to COVID-19, the classes and training in person has all but stopped completely.

With Virtual Reality, surgeons can stream operations globally and allow medical students to actually be in the best possible location in the operation theatre using their VR goggles. No

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distractions, no audio issues, and no chance of contracting Covid-19. In many advanced universities and institutes, students are already being taught subjects like human anatomy, kinesiology, neurorehabilitation and surgeries using VR technology. Moreover, as an added advantage for the physicians of the world, the videos can also be accepted as continued medical education (CME) credits.

VR Training saves travel time, travelling cost and the learner can view it repeatedly from the comfort of their home. Most importantly, in times of the COVID-19 pandemic, while social distancing is the new normal, Virtual Reality is the safest and most advanced way of learning. VR learning isn't limited to word descriptions, 2D screens, or textbook illustrations. It puts educators and learners in the same room, saving time, cost and energy yet allowing them to safely dive deep into an actual operating room, and explore the topic as the viewer sees fit. VR training will become the new normal that will far outlast the pandemic.

No training is complete without initial supervision of a procedure and actual experience. You cannot compare apples with oranges. But why do commercial pilots undergo rigorous amounts of simulated flight training before sitting in the real cockpit of a 747? Because these are experiences that lead to understanding.

What do Research Studies Conclude about this Method of Learning?

According to a research study in Dubai on the use of 360° VR in the medical field which was critically appraised by peer groups, it was concluded that VR provides a rich, interactive and engaging educational context that supports experimental learning by doing. From this research it was also known that it raises interest and motivation for students and effectively supports knowledge retention and skill acquisition.

A research by Harvard University showed that surgeons who are trained by VR had 230% boost in the overall performance compared to traditionally trained peers. This same study found that VR-trained participants completed the procedure an average of 20% faster than the traditionally-trained group. They also completed 38% more steps correctly in the procedure-specific checklist. Both findings were statistically significant [1].

Apart from Learning Where Else can Vr Be Useful in The Medical Industry?

- Medical and healthcare conferences usually have a lack of audience engagement. A very engaging one-to-one and descriptive conference can be held using VR technology and this idea has already been put to reality in Los Angeles by Dr. Brennan Spiegel where an entire medical education conference was given in VR.
- For neurologists, physiotherapists, kinesiologists and movement specialist using VR for neuro rehabilitation in cases like cerebrovascular accident (CVA) and traumatic brain injury has shown to increase patient engagement with better and faster results. With VR each exercise is tailored to patients' therapeutic needs.
- In children having cerebral palsy and getting treated by VR therapy there was a significant improvement in their mobility and motor milestone achievement [2].

- Doctors and nurses are the front line of diagnostics and treatments and as such are most susceptible to the covid-19 threat but with VR based diagnostics they don't need to be in contact with the patient until absolutely required. In fact, VR technology would enable many of them to work from home instead of having to travel to work daily thereby reducing risk of infection and saving travel cost and time.

To conclude; challenging times bring out the best in us and being optimistic in that humanity, as always and with a little nudge from technology, will make the right choices such as Virtual Reality training, to overcome threats to its existence. Utilizing VR's powerful yet cost effective ability to advance a better educated tomorrow.

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