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PROSPECTS OF VIRTUAL AND AUGMENTED REALITY USE IN DENTISTRY

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Virtual reality technology can be defined as “a three dimensionally environment which is simulated to give the user sensation of being inside it, controlling of it, and to interact with it by himself”. It is mostly generated with computers.

Augmented reality is an interactive experience of a real-world environment where the objects that reside in the real world are enhanced by computer-generated perceptual information, sometimes across multiple sensory modalities, including visual, auditory, haptic, somatosensory and olfactory.

Virtual reality can be used to instruct the surgical procedures, patients’ education and students’ training. The 3D virtual views help in progressing the dental experience by intervention of the distraction. This can be get by a 3D models of teeth or a human head that used by the trainee dentists to learn and training on a lot of dental technologies without harming the virtual patient. They can make any errors, discover the cause of it and know the proper way to correct them.

Using Virtual reality in dentistry is not an easy task due to the complexity of dental instruments and the diversity of oral tissues. In surgery, haptic devices permit operator to be in touch with the objects and feel of it such as surgical tools and human organs in a virtual environment as well to carry out surgery with different actions and by realistic force feedback like pushing, pulling, and cutting of soft or/ and hard tissue.

Unlike classroom education, in Virtual reality system it is possible to practice and receive assessment as many times as wanted and in any time.

“3D dental patient” is the most popular application of Virtual reality in training, this system makes the trainees capable of understanding the anatomy of the teeth and mouth in general, it is provided in the form of a haptic input device or ‘Phantom’ controller which controls the virtual drilling of teeth. With time, the trainees will become more familiar with the anatomy of teeth that give them the experience, knowledge and trust to treat the actual patients.

Dental Chair system or ‘HapTEL’ (haptics technology enhanced learning) is another application of Virtual Reality in training, it is designed to learn a range of dental technics to students and clinicians. The system consists of a mirror and a haptics based drill which make the operator able to carry out diverse processes, so the operator can ‘feel’ the pushing of the virtual drill which is due to “force feedback”. Possible application of virtual reality is as follows:

1. Virtual reality has the ability to remove the association of fear, pain, and anxiety during patients’ dental visits, and the results have been positive
2. Doctors can use less nitrous oxide. The pain relief during procedures using Virtual reality measured twice the pain relief of morphine
3. Virtual reality is the premiere venue that will make your business stand out as a welcoming office. Distinguish your practice by offering an awe-inspiring virtual reality entertainment package
5. Improvement of your practice profitability by encouraging your patients to book needed procedures
6. Simulation of Your Ideal Office Design
7. Performance of Virtual Robotic Dentistry