



Sorin Teich

Three-dimensional thinking – it is just a matter of time

In 2016 Nintendo launched Pokemon Go, an augmented reality (AR) game that uses a technology which overlays virtual objects on the surrounding environment. Developed in the last decade of the 20th century as a training tool for pilots, AR became popular also as a training tool in education. One of the reasons that AR became so widely used is that it no longer required expensive hardware and sophisticated equipment. Recently, Google introduced an AR platform (Google Lens) running on mobile devices, that uses artificial intelligence to recognize objects in order to suggest shopping options. This followed a previous less successful attempt to develop Google Glass, which required eyewear and raised serious privacy concerns.

Although AR shows promise in gaming, commerce, and rudimentary education applications, it has inherent limitations such as the lack of capability to allow manipulation of virtual objects. Parallel to the development of AR applications, virtual reality (VR) quickly emerged as a powerful alternative; contrary to AR, VR immerses the user in a virtual world through wearable head gear. This immersion, however, disconnects the user from the real world and, as a result, limits its applications. It seems that a third emerging technology provides a solution to the limitations imposed by AR and VR. In 2016 Microsoft launched a mixed reality (MR) device (HoloLens) that superimposes 3D holograms onto real-world surroundings. Users can interact with the holograms by hand gestures without the need to touch any physical object.

Our profession has also made progress towards digitization. The establishment of CAD/CAM technology has been a game changer for the production of restorations by means of digital design. In addition, rapid prototyping (such as milling and 3D printing, digital orthodontic planning, and guided surgery) has provided the general dentist with unprecedented tools that allow the provision of services that were mainly restricted to specialists. To that end, practitioners have had to develop digital workflows in their practice and get used to communicating in different ways with labs. Digital communication and treatment planning involving specialists, general dentists, and technicians means that all are now dependent on collaborative technologies conducive to a collective commitment to participate in cooperative action for the benefit of the patient.

It is just a matter of time until AR, VR, and especially MR technologies will be harnessed to benefit dental education and subsequently treatment. This in turn will require faculty to accept that manual skills are an essential but not sufficient component of contemporary dental education and practice. Practitioners will have to keep adapting to these technologies in order to preserve their competitive edge, while constantly evaluating the best available evidence supporting novel techniques. Students will contemplate where to acquire their education based on how well institutions integrate novelty to prepare them for a soft landing in practice. Finally, patients will have strong expectations that their dentist is “cutting-edge.”



The main difference between current digital or enhanced-reality technologies and those that emerged in prior decades is the visual/graphic component that is embedded in these new devices. From the customer (either student or patient) perspective, we will face a growing expectation to have visible digital processes in dental schools and practices. We have to accept and

embrace this trend and begin developing a culture of three-dimensional thinking. We are leaving the era of flat-screen video communications and entering uncharted areas in dental-digital education and practice.

Sorin Teich, DMD, MBA
Associate Editor