



Immersed in the subject

Immersive learning could revolutionise learning in schools, say proponents. But others aren't so sure, finds **Julian Hall**

If someone told you that in lessons, your child could jet off to Africa, voyage through the arteries of the human body, or even travel back to the 15th century, you might not believe them. However, with the fast-emerging technologies of virtual reality (VR) and augmented reality (AR), such feats are already possible.

For the uninitiated virtual reality involves the creation of immersive computer-simulated environments, currently being popularised by the likes of Oculus Rift, the start-up recently bought by Facebook for a cool \$2 billion

(£1.3 billion). Augmented reality (AR) by contrast involves the overlaying of computer generated content – video, graphics, text or sound – onto real world images captured by smartphones, tablets and hi-tech glasses.

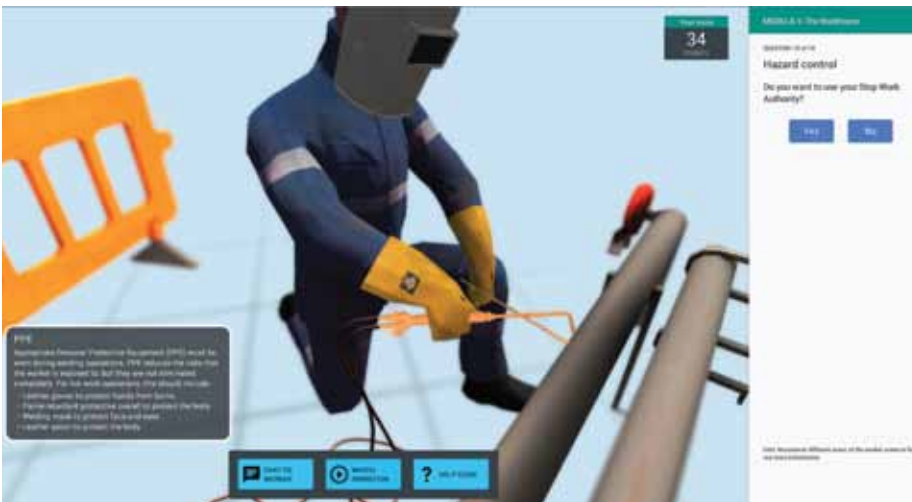
The advantage of both, says Phil Stone of Plural Strategy, is that “learners can experience ‘real-world’ situations that would otherwise be difficult to access”.

“This intermediate environment can be entirely artificial and isolated from reality – often referred to as virtual reality – or it can represent an

environment that is real but enhanced or somehow altered through the use of technology... The potential benefits are clear.”

A nascent industry

So far immersive learning has been mainly deployed by industry, with tech firms helping businesses train adults in technical – or dangerous – areas online. A case in point is British start-up Immerse Learning, whose 3D simulative programmes are used in medicine, aviation and by oil companies. The form



Morpheus and Microsoft's HoloLens are among the other notables, while the Google Cardboard offers a fun, lower cost option.

At the same time, an increasing number of immersive learning providers are creating solutions for such platforms, and a competitive industry is emerging. Just some of the rising players include Daqri, Eon Reality, Mymic, Simvirtua, 4D Creative, Immersive, Immerse Learning and Caspain.

A rising star in the AR space is Blippar, a firm already big in retail advertising. It allows learners to use the camera function in their tablet or smartphone to recognise images and to trigger an augmented experience, from a 3D image to a video to an interactive game. Colum Elliott-Kelly, head of education, says that the firm is developing "a suite of education-tailored products" that aim to make lessons more interactive, engaging and visual.

Perhaps more interestingly, however, it is also helping major education publishers to stay on their game, with Blippar now being integrated into third party resources.

Sceptical reality

While of this is exciting, what still remains unanswered is whether immersive learning actually improves outcomes. As Walsh notes while there is a plethora of evidence to suggest the benefits of applying VR in various forms in the domains of science, medicine and the military "this brand new form of educational VR, powered by technology like the Oculus Rift, doesn't have enough case studies attached to it."

For proponents like for James Corbett, managing director of Dublin company MissionV: "VR already helps to increase students' understanding and memory of new material. We remember 10% of what we read, 20% of what we hear, 30% of what we see... but about 80% of what we personally experience. VR allows us to personally experience things that we never could in reality."

Stone meanwhile believes that "these technologies could lower the cost of failure, offer previously unavailable access to certain scenarios and increase learner engagement. In highly skilled and technical areas they also offer the prospect of reduced cost of training once the technology hits scale."

can even teach West African healthcare workers how to correctly take off and put on their protective gear in order to prevent the spread of Ebola.

While such headline-grabbing applications are harder to imagine in schools, the 'fantastic voyage' quality of immersive learning could be hugely exciting for younger students - as well intriguing for their educators. Araon Walsh, director of the industry trade group the Immersive Education Initiative, gives an example of an AR-VR combination (yes, they can be used in tandem) in Colorado, where school-age students are "building" historical sites and scenes including the Boston Tea Party.

"They are constructing it in VR and re-experiencing being on the ship, while also setting up AR tours where people with cellphones can access extra information."

Other examples include students "becoming" red blood cells and flowing through an artery in the human body;

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manipulating DNA strands and replacing genomes; virtual study tours that put language learners in, for example, Paris or history students in the pyramids (all VR). Meanwhile we've seen the advent of 'immersive field trips' that use AR to overlay reconstructions of ancient buildings onto ruins.

This is all in large part possible because of the rapid development of the hardware that facilitates it. A most high profile example is Oculus Rift, whose VR headsets take users directly into a 360 degree, 3D virtual world. Sony's Project



► Others are yet to be convinced, however. For Stephen Haggard, a specialist in new media and e-learning, the issue is locating the less about technological advances, more about how to deliver truly improved education experiences. “It’s about finding the value point of immersive learning. Immersion is available without technology too, like in role plays, but its value is not in the immersiveness, it’s in the thoughtful reflections shared with experienced people before and after.”

He adds: “Simply switching the immersion from real-world delivery to VR delivery won’t necessarily improve outcomes. In fact, by making the experiences so engrossing, it could hobble the reflections and make learning worse.”



Aware that a lack of evidence around efficacy could hold providers back, Walsh’s organisation will run the Immersion 2015 conference in Paris this September. He describes it as the “first phase” of convening experts to bring together findings and share them

in public. The event has the feel of a Great Exhibition for immersive learning, bringing together purveyors not just of VR but also robotics, neurogames, 3D printing, holograms and cybernetics.

One also suspects it’ll be a huge marketing opportunity. However, this



alone won't throw open the gates to a brand new market; there are practical barriers to consider as well. The upfront cost of the hardware needed to run VR in particular could well offset the potential long term cost-saving benefits. According to reports in September, the Oculus Rift headset could cost about \$200-\$400 when released later this year – a steal for consumers perhaps, but trickier for schools that must provide hundreds of headsets per year group.

On top of that, teachers will also need to be retrained to make best use of these technologies – although it's not beyond the bounds of possibility that they'll manage. To achieve these ends, schools will need to invest but they will be less inclined to do so without more

robust evidence of immersive learning's benefits.

Properly defining quality in order to guide educators will also become key as solutions proliferate, says Walsh. "A good virtual experience is key to the learning experience," he says. "Think of it like a movie. Some movies don't raise the heart rate, some get a powerful psychological response, and that cements memories even more deeply. Properly constructed experiences with proper learning activity can, some studies say, helps students learn up to 30% faster."

Overall, it seems that beyond use for high stakes training in engineering, aviation, and medicine, immersive learning is yet to go mainstream. For Haggard, the next few years will be a

zone of "experiment" in which we start to get a better feel on what works and what doesn't.

"My bets are more on AR with its superimposing of reflective content on top of experience," he says. "VR's promise of extreme immersion without a reflective space is of course more compelling as an entertainment proposition, but it risks being too narrow to achieve the changes of behavior and the thoughtfulness that education is all about."

One way or another, the future of technology based learning is getting more ambitious – and immersive learning businesses will be making a more vocal case to feature prominently in the education ecosystem. ■