

THE CHALLENGE

TAFE NSW is the leading provider of vocational education and training in Australia. Each year, more than 500,000 students enrol into nationally recognised courses and training, studying at one of our 130+ delivery locations and/or fully online.

As the largest accredited training provider in Australia, we have a responsibility to consider the potential that emerging technologies have to dramatically improve and optimise the teaching and learning experience of our students.

When considering emerging technologies in this context, Virtual Reality is a 'stand-out' technology that shows the greatest promise in terms of scaling high-quality and safe immersive learning-by-doing training:

"VR technology can enable more effective learning at a lower cost and in less time than many traditional learning methods. This is because VR can allow for more training repetitions, especially when dealing with costly, rare, or dangerous environments."

'Real Learning in a Virtual World', Deloitte Insights, Aug 2018

The challenge for TAFE NSW in this context is to determine where and how this technology should "fit" in the organisation, and if it has potential to improve learning outcomes.

THE SOLUTION

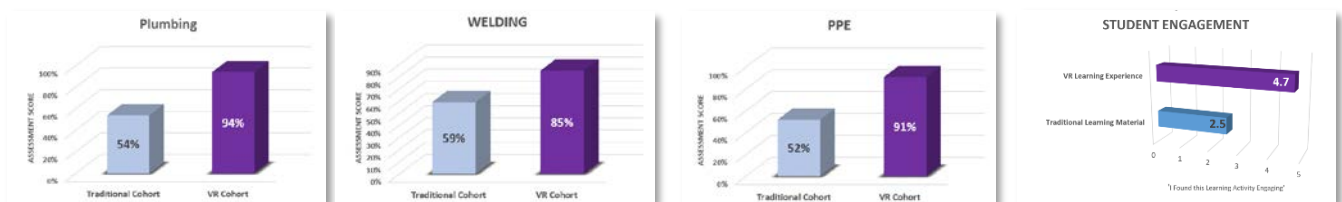
With Executive Sponsorship from the Managing Director, the TAFE NSW Digital Lab launched an Immersive Learning Prototype project, collaborating with industry and SMEs across our delivery group. The broad questions we set out to answer included:

1. What does the future market landscape for VR/AR look like?
2. What makes a VR/AR training experience authentic?
3. Is there a 'proven' student benefit (e.g., improved learner engagement and learning outcomes)?
4. What are the pros / cons of developing immersive content in-house vs. external 3rd party?
5. What data can be gathered from a VR/AR training experience?
6. What would the approach to scale look like for TAFE NSW and how would ROI be evaluated?

We developed 8 x Virtual Reality learning applications, targeting specific learning outcomes in units of competency from various accredited courses, including Building and Construction & PPE, Plumbing, Welding, Animal Science, Stage Lighting, Early Childhood Education, Science Lab Techniques, Eye Anatomy.

LEARNING IMPACT OUTCOMES

Independent (3rd party) A/B testing (with students) of three of these experiences, concluded in January 2020, revealed ([click here](#) to see a video (3:44) about the testing methodology and results) that students who completed training in virtual reality were more successful (combined Learning Outcome Improvement of +64%) at completing their assessment tasks than compared to the traditional learning cohort:



Using a Likert scale, students also responded to a post-assessment learning survey, which revealed that students engaged in learning via Virtual Reality scored learning engagement via VR **88% higher** than students who were engaged with traditional learning material.

RETURN ON INVESTMENT

Development was conducted in a highly scalable way, making assets reusable across scenarios. Compared to outsourced / 3rd party external development, we delivered a **47% cost saving** to TAFE NSW by managing the entire development process internally.

TAFE NSW students also participated by developing some of the 3D assets, as part of their course (animation and games design).

Each scenario was built in Unity and with deployment optimised for Oculus Quest VR Headsets, with pricing per headset in Australia starting at AU\$649. As this technology is portable and requires no cabling or expensive computers, it is highly scalable for an educational institution.

With a demonstrated improvement (+64%) of learning outcomes, and demonstrated improvement (+88%) in student engagement, these learning experiences are expected to have a direct impact on student completion. Internal modelling has demonstrated that a modest 5% increase in student retention / completion for just one of the courses relating to these prototypes, will generate additional revenue of >\$520,000.