



CREATION OF 3D DIGITAL TWINS TO ENHANCE STUDENT LEARNING IN DIFFICULT-TO-ACCESS ENVIRONMENTS

BACKGROUND

Each year around 9,500 medical school places are made available across the UK to train new doctors. However, the UK Government has hinted at capping this number to ensure every student is gaining valuable learning and assessment standards are maintained.

With the expansion of medical schools, areas such as surgical suites and intensive therapy units (ITU) will grow increasingly difficult for students to access, potentially hindering their learning and progression within their medical fields.

The University of Liverpool's VEC, the University of Liverpool's Medical School, and the Countess of Chester Hospital (NHS Foundation Trust) have undergone a collaboration to explore how emerging digital technologies and tools can support medical students in gaining valuable and realistic experiences within these typically restricted or hard-to-access areas within the hospital.

CHALLENGE

The teams worked together to assess and discuss the number of methods possible for improving accessibility and enhancing the student learning experience. Amongst these concepts was a 3D digital twin and simulation of a surgery suite or ward, which students can virtually access via virtual reality (VR).

SOLUTION

3D twins enable users to explore spaces on a digital screen or with a virtual headset for greater realism. Here, students can safely explore a restricted area, becoming more familiar with their surroundings, avoiding hazards, and developing further learning of procedures.

The VEC worked alongside several sub-teams within the Countess of Chester Hospital such as the surgical and simulation teams, ITU Teams, the Trust Executive, and medical students. Together, the teams coordinated a plan for constructing such virtual environments.

A Matterport scan accurately captured the restricted spaces, recreating these into a digital plan, which was reconfigured and additional information and resources overlaid for supporting and assisting in the medical students learning.

BENEFITS

The virtual spaces can be viewed in 'doll house' mode, enabling the user to manoeuvre around the complex with ease, becoming even more familiar with the operating space and beyond. In addition to improving the education levels of students, the 3D model hopes to reduce the anxiety felt ahead of upcoming examinations and even procedures.

These models can be tested amongst medical students, gaining qualitative feedback for assessing future modifications to ensure the model delivers value and impact for students. In the future, the creation group are looking to enhance the functionality of the 3D environment, introducing games and tasks set for the students that can improve learning and simultaneously collate test results.

This model can be adjusted or amended in the future to represent any changes to the restricted spaces or procedures over time with additional resources being added to the model to keep this up-to-date and accessible for years to come. For example, the teams are looking to film an operation within virtual reality, which can be streamed through the simulation.

AWARDS

Since the project's initial introduction, the team has won 'Best Oral Presentation' at the University of Liverpool Associate Clinical Teacher Day (October 2023).

In addition to this, Matthew Fok of Countess of Chester Hospital has been awarded an 'SRS Young Investigator Award' and 'Best Poster' at the Medical Education Research and Scholarship for Everyone (MERSEY) conference in November 2023.

'A novel partnership with the VEC has pioneered a transformative approach to medical education and patient care with the creation of a cutting edge 3D/VR digital twin. Working closely together with the VEC on these projects has led us to realise the immense potential that immersive technology and innovation has for revolutionising medical education and healthcare.'

- Matthew Fok, Countess of Chester Surgical Research Fellow

