Virtual anatomy system brings benefits

01 June 2018 | Education (/education)

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Assoc Prof Pillai (right) explains how the VIHA system allows students to manipulate the structures of a human body using a virtual reality headset and a hand-held remote controller

Students from NUS Yong Loo Lin School of Medicine (https://nusmedicine.nus.edu.sg/) (NUS Medicine) are now able to dissect a human cadaver using virtual reality headsets and hand-held controllers, thanks to a new system launched recently by the Centre for Healthcare Simulation at the School. The Virtual Interactive Human Anatomy (VIHA) system allows students to manipulate intricate three-dimensional (3D) virtual renditions of the human body, supplementing hands-on training done with real human cadavers and enhancing the teaching and learning of human anatomy.

Students can perform dissection on a specific or general part of a virtual human cadaver, removing body parts to uncover underlying structures and viewing them from multiple angles. Each move can be reversed and repeated until the student is familiar with the relationships between the various components of the body — something that is not possible with an actual cadaver.

“VIHA allows students to navigate the human anatomy at their own pace, reviewing and reinforcing complex spatial relationships of anatomical structures like muscles, bones, nerves, arteries, veins and organs. Animation of joint movements has also been incorporated to highlight muscle actions in producing certain movements. This helps students with visualisation and gives them a better understanding of the connection between the various structures,” explained Centre Director Associate Professor Suresh Pillai, who is also Senior Consultant at the Department of Emergency Medicine, National University Hospital. He added that this bridges the gap between textbook learning and dissection in an anatomy hall.

Head of NUS Anatomy (http://medicine.nus.edu.sg/ant/) Associate Professor S T Dheen said that the blending of hands-on training with virtual reality experience has elevated the teaching of human anatomy to a whole new level. “Traditionally, human anatomy is taught through cadaveric dissection and use of anatomical models and prosected specimens in medical education…Although there is no substitute for cadaveric dissection in learning human anatomy, incorporating recent technological advancements like VIHA in pedagogy certainly enhances the learning process and transforms the learning environment,” he said.

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> — Assoc Prof Suresh Pillai, Director, Centre for Healthcare Simulation

VIHA training is currently available for first and second year NUS Medicine students, while those from Year 3 onwards will be introduced to VIHA training progressively, with more advanced features including more interactive animation, clinical pathology and self-directed questions. There are also plans to extend VIHA to nursing and postgraduate students, and potentially surgical residents for pre-operative surgery planning and rehearsal of procedures, as well as to introduce more complex training scenarios, such as an emergency in a hospital ward or a mass casualty incident.

Year 1 NUS Medicine student Sheikh Izzat B Z-A Bahajjaj said that the virtual reality tools were beneficial. “I find the VIHA experience very effective and practical in my learning of anatomy as it is easy to use and provides a clear, 3D visual representation of anatomical structures that are hard to visualise in the textbook.” He added that it also allowed him to better observe and appreciate various structures, such as the courses of arteries, veins and nerves, which would be difficult when using a specimen in the anatomy hall.

See media coverage (http://news.nus.edu.sg/news-reports/vr-system-helps-study-human-anatomy).