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VR system helps in study of human anatomy

Limited number of cadavers for teaching also fuels NUS Medicine efforts to tap virtual reality

Low De Wei

Virtual reality (VR) has been hyped as the future of gaming, but the National University of Singapore's Yong Loo Lin School of Medicine (NUS Medicine) has been using it for more educational purposes.

Since last September, it has been fine-tuning a system called Virtual Interactive Human Anatomy (VIHA) which allows students wearing a VR headset to delve into the anatomy of a human body by freely manipulating and looking inside different parts and structures, using a controller in their hands. Self-narrating modules help them to learn about what they are looking at.

The system was showcased at the university yesterday.

Questions and animations featuring real-life situations, such as rigorous exercise's effects on leg muscles, and how a hip fracture might affect blood flow in certain arteries, also test students' knowledge on how real-life situations can affect different body structures.

Associate Professor Suresh Pillai, director of the Centre for Healthcare Simulation at NUS Medicine, which launched the system, said deficiencies in anatomy knowledge and a lack of appreciation for how different body structures work provided a strong impetus for the development of the system.

The limited number of cadavers available for anatomy teaching here also fuelled the efforts. NUS Medicine currently has 100 cadavers, made up of donated and unclaimed bodies, said Associate Professor S. T. Dheen, its head of anatomy. NUS Medicine received 45 cadavers last year, up from 34 in 2016.

But Prof Dheen warned that with 300 students entering NUS Medicine each year, and no guarantee of a steady flow of cadavers each year, other methods are needed to complement the use of cadavers to teach students in a more thorough and sustainable way. Dissection classes are now offered as elective courses. But most students only get to handle dissected cadavers up to two hours a week, often in groups of 10 to 15 per cadaver.

The Virtual Interactive Human Anatomy (VIHA) system allows students wearing a VR headset to delve into the anatomy of a human body by freely manipulating and looking inside different parts and structures, using a controller in their hands. PHOTO: LIANHE ZAOBAO

As the school set out to develop the VR system, initial hopes to work with experts from the private sector were soon dashed.

"We realised that despite possessing a lot of experience in developing games, few had experience developing VR products for the medical sector," said Prof Pillai.

This led the centre to tap homegrown talent and resources from the NUS Smart Systems Institute to develop a system that could meet teaching needs.

After three years and $3 million of funding from NUS for development and fine-tuning, the system was finally rolled out last year for first- and second-year NUS Medicine students.

More tech innovations in teaching are in the pipeline, with NUS working on another VR platform which will feature real-life scenarios like hospital ward emergencies and mass casualty incidents that multiple students can respond to.

Prof Pillai aims to make simulation form up to 20 per cent of the curriculum for medical students, up from about 15 per cent currently.

"Learning can be fun and cool," he said. "Mixing this technology with time-tested methods will ensure greater retention of knowledge and potentially, better care for patients in clinical settings."

lowdewei@sph.com.sg