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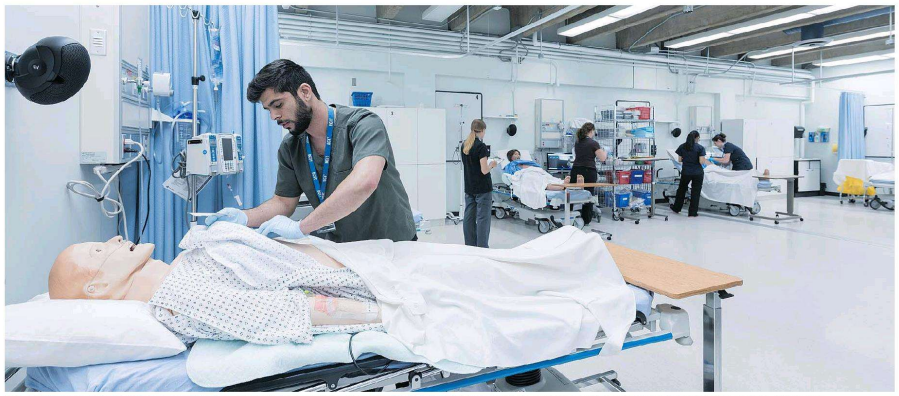

Students of the critical care nursing program at BCIT's School of Health Sciences get hands-on experience working with interactive robots, setting them up for real-world emergency situations. CREDIT: SUPPLIED

HIGH-TECH, HIGHER LEARNING

From virtual reality to bleeding robots, BCIT students get leading-edge training for the jobs of tomorrow

JOEL SCHLESINGER
POSTMEDIA CONTENT WORKS

If students attending polytechnic institutes have one overarching goal, it's receiving job-ready education so they can start their careers as soon as possible after graduation. That's certainly a big reason why 48,000-plus full- and part-time students attend the British Columbia Institute of Technology (BCIT), says James Rout, associate vice-president, education support and innovation at BCIT.

"As a polytechnic, our job is to get jobs for our students," he says. "But it's more than that – we also want them to have access to the latest technology for enhanced learning so they have skills and knowledge that will help them flourish and drive their respective fields – five and even 10 years down the road."

Central to this philosophy is BCIT's focus on integrating leading-edge simulation technologies like virtual reality into its curriculum.

> We want our students to be on the front line of leading innovation, pushing the boundaries of not just existing industries, but the ones of the future, too

"There are a number of post-secondary institutions doing work in these areas, but where we're innovative and unique is developing a comprehensive cross-institution strategy with three major strategic directions."

First, BCIT is creating programming that will make students experts at developing virtual reality (VR) and augmented reality (AR) technologies.

The second piece is integrating these technologies in the classroom to improve learning experiences. Third, the post-secondary wants to build awareness of the technological implications of VR and AR technologies by providing access and training to BCIT staff and faculty.

The full potential of these technologies is yet to be realized, but BCIT is already ahead of the curve, providing some of the most impressive hands-on educational experiences anywhere in Canada.

"We want our students to be on the front line of leading innovation, pushing the boundaries of not just existing industries, but the ones of the future, too," Rout says. "And we believe really strongly that embracing new innovations – like VR and AR – position BCIT well to do just that."

Virtual reality, real-world learning

Students explore 3D simulations for deeper understandings

When Vince Piva saw a 3D scanner a few years ago at a technology fair in Las Vegas, the BCIT instructor immediately realized its potential as a learning tool for teaching his automotive service technician students. Little did he realize just how important this technology would prove to be at the institute. "We're just scraping the tip of the iceberg in terms of what we can do," he says.

A technology that allows instructors to make exact digital copies that can be explored in a virtual 3D world on a tablet or laptop is an important teaching tool in and of itself. But it's how the high-tech device is being paired with virtual reality and augmented reality (sometimes called mixed reality) technologies that is opening up a new realm of possibilities for students to gain a deeper understanding of the subject matter.

Among the first objects scanned was an automatic transmission. Very soon afterward, Piva and other instructors began to understand the enormous scope of its potential. Not only could students explore, disassemble and re-assemble the virtual transmission on a laptop – getting important experience prior to working on the real deal – they could also use Microsoft HoloLens glasses to tinker with the virtual transmission in augmented reality, essentially manipulating a 3D hologram overlapped onto the actual world. "Basically, you're wearing these special glasses and you can disassemble the transmission live, and virtually hands-on," Piva says.

Students at the BCIT Tech Lounge use the Microsoft HoloLens to take apart an automotive transmission at the recent BC Tech Summit. CREDIT: SUPPLIED

Until now, the school has only used these technologies on a trial basis for the automotive program, but BCIT aims to incorporate these technologies into regular curriculum this fall. If the students who test drove these technologies last semester are any indication, VR and AR will be a much welcome addition to the classroom. "These students were so gung-ho about the experience that they really couldn't get enough," Piva adds that going forward, providing BCIT students with as much opportunity as possible to use VR and AR is a key objective. "There are not that many people using this technology yet, even in the automotive industry, so we want to be proactive rather than reactive, making our students experts not just with the automotive technologies of today, but tomorrow as well."

Tech-savvy students, job ready

Revolutionary education puts BCIT grads in high demand

It's not about technology. It's really all about the people.

All of BCIT's time and effort incorporating new technologies – like robotics and virtual reality – into its curriculum have one key objective: training highly skilled, upwardly mobile graduates who are among the most sought-after workers both in B.C. and internationally, says James Rout, associate vice-president, education support and innovation at BCIT.

"We want to expose all our students to this technology because we believe they will be using these tools in the workplace well into the next decade," he says.

Part and parcel to this initiative is forging deep connections with the province's top employers, whether that's government agencies or high-profile corporations – including Microsoft.

In fact, Microsoft technologies have long been key components of programming across BCIT's five campuses. And now Microsoft software and hardware will also play a central role at the institute's new tech hub.

"The world is moving fast, and technology is an integral part of every industry and often the driver of innovation," says Edoardo De Martin, director of Microsoft Vancouver.

"So access to the latest hardware allows students to experiment and explore technology."

Of course, this familiarity and competency with technologies like virtual and augmented reality devices help prepare students for the real world when they enter the workforce. These include Microsoft's HoloLens – specialized glasses that project holograms. BCIT recently purchased a couple dozen HoloLens to explore the possibilities of the technology for enhancing learning experiences for students. "And at Microsoft, we are very eager to see how BCIT uses this technology in the classroom, and to work with them to help execute that vision," De Martin says.

Given Microsoft Vancouver is one of six global development centres for the tech giant – employing more than 600 people locally, including BCIT grads – students with proficiency in these technologies are certain to be on the firm's radar, as well as that of other leading employers.

"Graduates with job-ready skills are incredibly valuable to organizations like ours because they will be working on leading edge innovations," De Martin says. "They enter the workforce prepared to make valuable contributions."

BCIT instructor Rob Kruger with nursing students and medical 'sims'—life-like robots used to simulate working with real hospital patients. CREDIT: SUPPLIED

Augmenting the reality of critical care:

BCIT's School of Health uses robots to simulate working with real patients

They bleed. They cry. Heck, some even give birth. The medical 'sims' – lifelike robots now in use at the BCIT School of Health Sciences in its critical care nursing program – do just about everything a real hospital patient might. Learning the ropes on interactive robots provides a unique educational opportunity for students, giving them as real-world an experience in emergency health care as they can get without being thrown into a genuine hospital, says BCIT instructor Rob Kruger. Kruger leads the program's simulation and innovation work.

"We have one of the largest simulation centres in Canada, with over 40 robots spanning from little neonates that weigh less than two pounds at 27 weeks gestation, all the way up to what looks like an older, retired, female patient," says Kruger.

"These robots do just about everything that can happen in terms of patient reactions inside an acute care setting."

> These robots do just about everything that can happen in terms of patient reactions inside an acute care setting.

While cutting-edge by some educational standards, medical sims have been an intrinsic part of the critical care nursing curriculum for many years, providing students with the unparalleled opportunity to get hands-on know-how in high-stress situations that can occur in a critical care setting – all in a safe, controlled and simulated environment.

"It's almost like our students are developing muscle memory, only in this respect the brain is the muscle," Kruger says. "That way, when our grads go to work in a clinical practice setting, they are a lot more confident and capable of jumping into the fray right away."

Capable of simulating childbirth (yes, a pregnant robot gives birth to a baby robot – really), trauma and heart attacks, the sims are so lifelike, students feel much like they would working with flesh and blood patients. And the aim is to expand the program soon to other health care disciplines at the school, including prosthetics and orthotics, and medical imaging technologies.

"We want them to get used to working in a team environment, which ultimately improves performance," he adds. "That way when they do face high-stress situations, they can draw on their experiences with the simulations and carry out their duties to the best of their

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