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Toronto Met University magazine

FOR ALUMNI AND FRIENDS

Professor Kris Alexander talks video game technology

GAME CHANGERS

TRANSFORMING HOW WE TEACH, LEARN, WORK AND PLAY IN THE VIRTUAL WORLD

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GAME CHANGERS

TRANSFORMING HOW WE TEACH, LEARN, WORK AND PLAY IN THE VIRTUAL WORLD

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photographs by Kate Dockeray

Applying what she learned in a video game design class, Sofia Beltran built her Twitch audience to thousands.

September 2020, third-year Media Production student Sofia Beltran was given a unique assignment: to begin a channel on the streaming platform Twitch. The assignment came in her *Introduction to Video Game Design* class – which she'd only taken as an elective.

Professor Kris Alexander asked each student to begin live streaming three times a week for three hours, with a goal of building viewers along the way. They could broadcast themselves live playing video games (as most users do), chat with people or showcase a hobby or talent.

Beltran had never been on Twitch before. But within three months, she had 2,500 subscribers – so many that the channel was helping her pay her rent. "The goal every week was to get a couple more viewers, but I ended up getting super invested in it," she said with a laugh. "I'd play a horror game on Friday – because they're my favourite – and then a chill game on Wednesday. And then I would just have a chat stream with people, asking, like, 'How's your weekend?'" she said.

Beltran is quick to credit her overnight success to the strategies gleaned from Alexander's class. For instance, his lectures gave her the idea to diversify her platforms by creating both short-form (30-second to one-minute TikToks) and long-form content (three- to six-hour Twitch streams). As a result, her TikTok account skyrocketed to 60,000 followers in five months. She was then able to convert much of that viewership to her Twitch account.

Today, having studied everything from user experience (UI/UX) design to digital marketing and esports, Beltran, 23 – who just graduated in spring 2022 – is an influencer manager at Behaviour Interactive, Canada's largest independent gaming studio. For Alexander, Beltran's quick leap from the classroom to a top gaming company isn't surprising.

Alexander, an academic leader in video game technology and curriculum development, has long seen the power and potential of the video game industry and the technology itself, not only for students pursuing careers in gaming, but for teaching and learning across the university. In fact, my first call with Alexander in April 2020 demonstrated just that. Prepared for a typical Zoom call, when I clicked to join my meeting with him, it was anything but a typical call. When his video turned on, there Alexander appeared: brightly lit in centre screen, surrounded by flashy graphics, as though he was reporting live from a high-tech broadcast studio.

Like a TV anchor expertly kicking off the evening news, he welcomed me to his virtual classroom as captions popped up, a virtual lecture hall appeared and I was immediately transported into another world.

Of course, Alexander wasn't in a broadcast studio. From his home computer, he was demonstrating the power of Open Broadcaster Software (OBS) (which is used for recording and live streaming), showing me how he was teaching his classes, and explaining that the future of teaching, learning, work and play lies in video game technology. Many others have embraced his vision.

In September 2022, Alexander gathered with TMU President Mohamed Lachemi, City of Toronto Mayor John Tory and esports partners OverActive Media and Waveform Entertainment, among others, to launch the Red Bull Gaming Hub at The Creative School – a state-of-the-art, world-class learning facility – where Alexander is director.

The Gaming Hub supports virtual production and broadcasting using Open Broadcaster Software [1] and Unreal Engine [2] – the latest version of one of the most commonly used game development engines – and features 36 high-performance gaming computers equipped with top-of-the-line AMD technology [3], eight 4K-HD televisions mounted on the walls, a 5:1 surround sound speaker system and a classic games library.

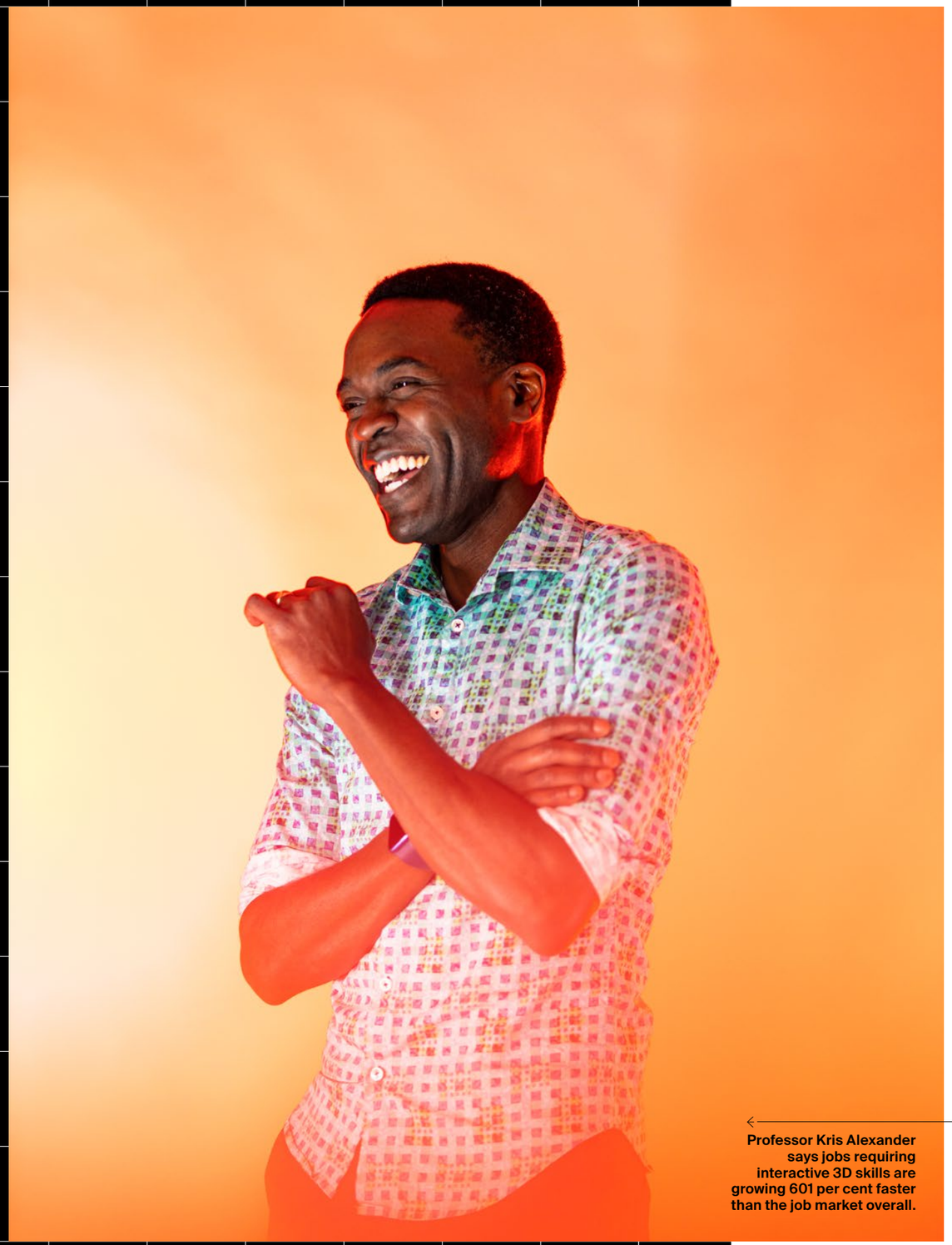
FUTURE JOBS FOR STUDENTS

But as Alexander points out, the space is far more than impressive equipment. "The Red Bull Gaming Hub is pivotal because of the humans in there who can talk the tech, teach the tech and train using the tech. That's a rarity in post-secondary institutions," he said. "It's industry leaders who are piloting this." The Gaming Hub, in partnership with Red Bull Canada, focuses on innovation and new applications of video game design, virtual production and esports

1. Open Broadcaster Software (OBS) is a free, open source software used for recording and live streaming. It captures and records your screen and audio. Popular with Twitch streamers, this software can eliminate the need for an internal capture card that can be expensive. It facilitates live broadcasts to streaming services such as YouTube, Twitch, Twitter and Facebook Live.

2. Unreal Engine (UE) is a video game development tool from the video game and software development company Epic Games. Developers use it to create virtual worlds, build a simulation, edit videos or sound, and render animations.

3. Advanced Micro Devices (AMD) is a top provider of CPU technology for desktop computers, servers, GPU graphics technology, high-performance computing and artificial intelligence processors, field programmable gate array processors and network accelerators.



Professor Kris Alexander says jobs requiring interactive 3D skills are growing 601 per cent faster than the job market overall.

broadcasting, while building educational, curricular and extracurricular activities to equip students like Beltran to thrive in one of the fastest-growing industries in the world.

"People see computers. I see the future – and future jobs for our students," Alexander said. "Jobs requiring interactive 3D skills are growing 601 per cent faster than the job market overall. And, these jobs are paying 57 per cent more than the average salary."

And while the industry's exploding, there's also a major skills gap in information technology-related careers. Alexander says that's where the Red Bull Gaming Hub, along with the various media production programs at the university, come in, equipping students for industry professions including production accountants, animators, 3D modellers, set VFX producers, quality assurance leads, community managers, producers, monetization designers, character artists, esports lawyers and more.

And as Beltran's example shows, RTA grads are already landing jobs with major industry players, including Epic Games, FaZe Clan and Interactive Ontario among many others.

DIVERSIFYING THE INDUSTRY

Beltran says her current role – where she secures influencer partnerships for a multiplayer horror video game called *Dead by Daylight* – is a dream. Not only does she love the genre, but as a Filipino woman, Beltran wanted to work for a company that values equity, diversity and inclusion – both with regard to its staff, and in the games they create. "There's still this idea that with the gaming industry, if you look at the top 10 Twitch streamers, there's only one woman of colour, but we know there are so many talented creators out there," she said, adding that she recently hired the drag queen Plastique Tiara, who was a contestant on *Rupaul's Drag Race*.

Having initially focused her studies on screenwriting for film and TV, Beltran is grateful she found her true calling – noting that at TMU she learned everything from video game psychology to project management and production. "I played video games growing up, but I'd never considered them professionally," she said. "They have a much more convoluted narrative, and there are more interactions built in, instead of a static experience, like with film, you're passively consuming it."

While students like Beltran are thriving in the gaming industry itself, students and professors in completely different fields are also using augmented reality (AR) [4] and virtual reality (VR) [5] to advance teaching, learning and research in revolutionary ways – shattering the stereotype that AR and VR is just for gamers. For instance, students in Architectural Science are using Mixed Reality (MR), which includes both AR and VR, to take their designs to a whole new level.

Professor Vincent Hui explains that usually, space and material limitations, along with cost and time constraints, have meant that projects couldn't be realized in a truly realistic way, until now. Using VR lenses on smartphones (more accessible than VR headsets, Hui says, since students have their own mobile devices), along with access to Unreal Engine, students have been able to create completely immersive virtual models of their designs.

David Chandross encourages students to build games to fix the world.

> "Using serious video game design, students at the academy are learning everything from how to do surgery in the field to mass casualty management."
>
> — DAVID CHANDROSS

PUSHING THE BOUNDARIES

"Now, students can jump inside the model they've created. They can walk through their design and say, 'Do I need to add lights here? Should I put a door here instead?'" he said. "There is so much value in this immersive quality." To further illustrate, he said one student who was designing a circus venue was able to use the technology to run and fly on the trapeze in the virtual model – and quickly realized that the ceiling was too low for the activity.

"Architectural studies can be debilitating for students who have all these great ideas, but have to wait until you can actually make it a reality. With this technology, so much more is possible," Hui said.

English Professor Irene Gammel, executive director of the Modern Literature and Culture Research Centre, has also experienced how AR and VR technology can push the boundaries of what's possible. One of her students created an educational tool called the "Chinatown Time Machine," a project involving video game design with a goal of giving users the chance to experience the history of Toronto's Chinatown West.

The student filmed various areas of the neighbourhood with a 360-degree camera. Using the video game engine, she was able to digitally insert historic landmarks and events within the footage she shot. When a user is physically in the neighbourhood, they use their smartphones or tablets to activate the digital interface that connects the game with the site to see history unfold before their eyes.

"In person, we see modern buildings, then suddenly a world opens up, and you can see that 100 years ago, different people were living here and you start to learn how it evolved," Gammel said.

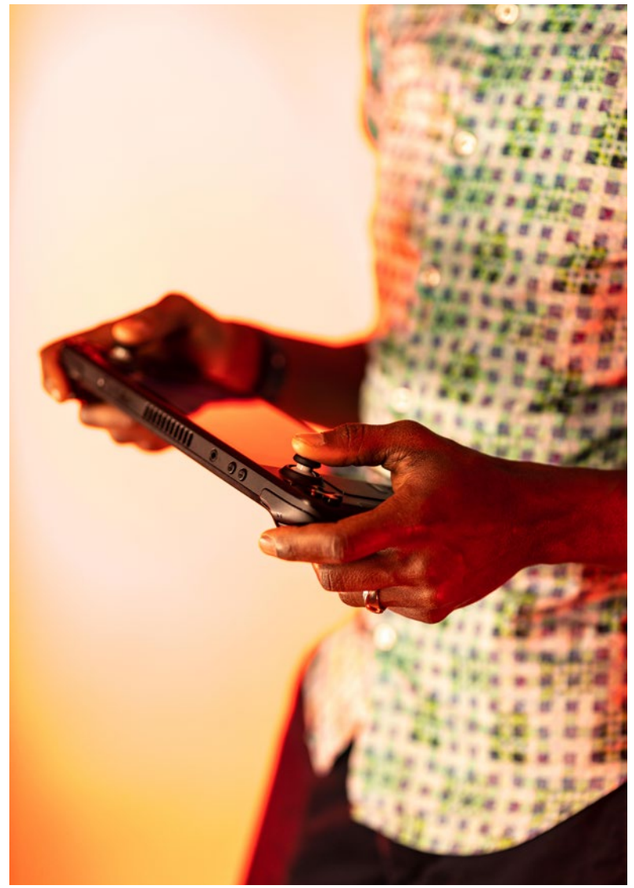
AVATAR CLIENTS

As Faculty of Community Services Professor Jennifer Martin's work shows, immersive VR is advancing the training of health-care professionals too.

Martin developed a graduate course, Online Relational Child and Youth Care Practice. It's designed to provide students with immersive VR experiences to help inform clinical practice, the integration of

4. Augmented reality (AR) is an enhanced version of the real physical world achieved through the use of digital visual elements, sound or other sensory stimuli and delivered via technology. It involves overlaying visual, auditory or other sensory information onto the world to enhance one's experience. Unlike virtual reality, which creates its own cyber environment, augmented reality adds to the existing world.

5. Virtual Reality (VR) is the use of computer technology to create a simulated environment which can be explored in 360 degrees. Unlike traditional interfaces, VR places the user inside the virtual environment to give an immersive experience. Users typically wear a VR headset, which removes vision of the real world. Players also typically use controllers in each hand, which translate their movements and gestures into the experience.



Dan Hawes: virtual classrooms offer creative opportunities.

trauma-informed principles, and to consider how interventions might be adapted to incorporate virtual reality. Using Oculus Quest VR headsets, students are taken through fully immersive digitally simulated situations with avatar clients.

"Students can engage in therapeutic encounters in ways that would be impossible in a typical classroom-based simulation," Martin said. "VR enables students to interact with the environment and virtual characters in a way that feels real, helping them engage in self-directed exploration, which fosters autonomy during decision-making." And that's not all. David Chandross, faculty member of the Master of Digital Media program, is teaching a project management course in serious game design – that is, how to design video games to help solve real-world problems.

Chandross's work is so impressive, he's now working for the World Health Organization (WHO), helping prepare those in the WHO Academy, the organization's lifelong learning centre, for crisis situations. "Using serious video game design, students at the academy are learning everything from how to do surgery in the field to mass casualty management," he said, explaining that the video games are 'storified,' with users having to make difficult decisions in challenging circumstances quickly to progress. "Each story has a different ending depending on the choices you make," he said.

Chandross says the possibilities in education are endless, noting that anti-racism training and other socially conscious topics can be taught in the same way, creating a more effective, engaging experience for the learner. "I encourage all of my students to build games to repair the world," he said. He supervises about 10 master's thesis projects on serious game design each year for The Creative School with most of his students focused on issues related to health, business and social justice.

Chandross is also working with Joanne Okimawininew Dallaire, TMU's Elder (Ke Shay Hayo) and senior advisor, Indigenous Relations and Reconciliation, to build the first immersive game which gives players the chance to experience Indigenous history in 3D. This project will bring the teachings of Indigenous elders to Indigenous youth, provide training in game design and help preserve cultural heritage.

No matter the discipline, TMU Instructor and Campus VR Producer Dan Hawes says there are countless benefits to teaching and learning in a virtual environment. Hawes recently built an entirely virtual lecture hall for students in an upper-year management course at TMU. Students joined from all over the world, either in 3D format with VR headsets, or via Twitch or YouTube stream.

"We even put a sunroof in the classroom, because why not?" Hawes said, noting that they added an ocean view to the side of the room to create a calming experience. Each student created a customized avatar – "I have purple hair when I teach," he laughs – and they used the arrow keys on their computer or a VR headset to move through the space.

The virtual classroom also offered real-time, anonymous feedback from students to professor. "Students can hit a happy face, which appears on a dashboard as green, but if they're not understanding something, they can hit a sad face, which appears as red," he explained. "If the metre goes from green to yellow, as a professor, you think, 'Hmm, maybe I should slow down,'" he said.

He also noted that engagement when using a VR headset is particularly high. "In-person, you always see students checking their phone, but in the VR classroom, they don't have that option," he said. "Plus, as avatars, people are actually more responsive. In-person, they're a bit more shy."

He also cautions that the use of VR should be carefully considered in the context of the material being taught. "If you're getting people in a room to discuss things, it's a wonderful mechanism. VR creates an increased sense of presence and elevates the student experience."

Alexander, who has long been using the same technology to teach his courses, couldn't agree more. Pulling up a video of a child learning to play the piano by viewing lights shining on the keys, he said, "Video games and video game technology are a vehicle to teach anything. This world is going to explode." ●

> **"Now, students can walk through their design and say, 'Do I need to add lights here? Should I put a door here instead?' There is so much value in this immersive quality."**
>
> – PROFESSOR VINCENT HUI

GAMES BY THE NUMBERS

> 23 million people

More than half the population of Canada plays video games. Worldwide, that number jumps to more than 3 billion.

$5.5 BILLION

Value of national games market. Canada is the third-largest producer of games in the world.

US$200 billion

The market worldwide is expected to generate around US$200 billion (about $264.6 billion CAD) in 2022 alone.