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Roger Williams University Partners with Google and Labster to Launch Virtual Reality Science Labs

Hands-on simulated labs offer students practical training and access to sophisticated technology found in million-dollar labs



Joshua Abston uses RWU's new virtual reality technology from Google and Labster to take a science lab on campus.

October 10, 2018 | By Jill Rodrigues '05 and Justin Wilder

BRISTOL, R.I. – Standing inside a private room in the University Library last week, Joshua Abston performed a biology lab assignment on cellular respiration, but it was actually taking place inside a virtual reality lab.

After drawing blood samples from volunteers on the basketball team, Abston brought the specimens for testing inside a state-of-the-art laboratory, where he slipped on a lab coat and sterile gloves to prepare for lab work.

Abston inserted the test strips into a blood glucose meter and lactic acid meter, getting instant results analyzing the effects of how dinner choices impacted player performance. Moving to the holographic table station, he pulled up a 3D image of a glucose molecule and highlights the sections being broken down by enzymes with a click of a button.

In fall 2018, Roger Williams University became the first university in New England to partner with Google and Labster to launch virtual reality technology into the classroom. Part of the university's Affordable Excellence initiative – delivering innovative education while holding the line on costs – the collaboration opens up a whole new world of sophisticated laboratory instruments, enabling students to gain practical training and access to technology found in million-dollar labs, without using any actual lab resources.

“Virtual reality has advanced to the extent where it is now capable of providing a higher quality laboratory experience at substantially lower costs,” RWU Interim President Andy Workman said. “Roger Williams University is proud to be part of moving this technology forward and pleased that our students will benefit in the process.”

When Google and Labster – the company that creates the virtual lab simulations, delivered through [Google’s Daydream VR](#) platform – announced they wanted to bring their technology to higher education institutions, Assistant Professor of Cybersecurity Russell Beauchemin brought the idea to RWU’s Technology Futures Committee. With his research interests encompassing virtual, augmented and mixed reality technologies, Beauchemin knew this would be an opportunity for the university to pilot an innovative teaching program.

“Virtual, augmented and mixed reality environments, specifically Labster, offer participants unique, inexpensive, and educational first-person experiences that mirror the use of industry-leading equipment and processes that students might otherwise not get to use or experience,” said Beauchemin, who worked to secure the partnership and program resources for RWU. “Access to these resources fits seamlessly with RWU’s mission of offering affordable excellence, so it seemed like a great fit with our ethos.”

The partnership provides Labster’s cutting-edge virtual-reality headsets not available to the general public, as well as the Labster’s award-winning [science lab simulations](#) designed by subject matter experts.

The technology is being piloted this semester with a foundational biology lab course, BIO 103, that includes classroom lectures, real lab assignments, and virtual-reality labs. It enables students to perform hands-on lessons that replicate the same tasks that would be conducted in a real lab, helping to prepare them for working in a professional lab with complex tools.

“This is a great example of our mission to deliver engaged teaching and learning: As a complement to our science curriculum, the technology adds to our arsenal of having students visualize science in 3D, at their own pace and in their own way, what they’re learning from the textbook and classroom lectures,” Dean of the [School of Social and Natural Sciences](#) Benjamin Greenstein said. “Virtual reality is a uniquely powerful tool that enables students to do things and see things that they wouldn’t be able to do in a lab, like dive right down into the cell and then draw back to look at the cell. It connects processes that are operating at microscopic levels to the macroscopic level.”



The virtual-reality labs comprise about one-quarter of the labs students in BIO 103 will be conducting in the course, in virtual reality and within a real lab setting on campus. The academic rigor of the virtual reality labs has been examined and approved by RWU biology faculty.

Offering these lessons in multiple learning modes can significantly expand reach to more students, according to Lecturer in Biology Katherine Mattaini, an expert in teaching pedagogy for STEM education.

“These labs will cover some of the more difficult concepts for students to learn, so the more exposure through different modes we can make available to them the better – some students learn best from textbooks, some from lectures, and some from visuals,” said Mattaini, who is teaching the BIO 103 course using the virtual-reality-simulated labs.

After taking his first virtual-reality lab, Abston, the BIO 103 student that tested the technology last week, agreed that the simulations are a great learning tool that allows him to apply what he’s learned in the classroom.

“It’s one thing to do something in a lecture and to learn a new concept, but it’s another to watch it happen in front of you. It makes it more real, more concrete to you,” Abston said.

Two sections of BIO 103 are piloting the program; one group of students are taking five labs through the virtual-reality simulations while another section will conduct the same labs using a software program on a desktop computer. At the conclusion of the course, Beauchemin – who coordinates the technology and trains faculty and staff in its use – will work with faculty members to evaluate the efficacy in teaching students in virtual reality versus a 2D online program.

Following the successful launch of the program this semester, RWU plans to expand the virtual-reality program to the School of Justice Studies with forensic science crime scene analysis and, further down the line, to the School of Architecture, Art and Historic Preservation for architectural modeling analysis.

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