

Riverside Virtual learning Center (RVLC)

This program will:

1. Train students to be leaders and educators in virtual reality (VR) equipment usage.
2. Allow student leaders to research and identify appropriate VR educational programming to support learning.
3. Student leaders are then able to educate their peers, and teachers, on educational programming that may be used across all content areas.
4. Finally, students will have access to VR centers at top universities (Yale, Harvard, MIT, etc.) and local school district VR programming to support future success in classrooms and careers.

Riverside Virtual Learning Center After-School Program

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Student learning has shifted to online environments where students are becoming acclimated to living their lives online. Learning is now in the Experience Age, where 92% of students spend a significant part of their daily life online in social media, live streaming, video, and messaging apps (Wadhera, 2016). As such, 21st-century students learn through experiences rather than teacher-transmitted information, leaving them to struggle and disengage with their learning due to a lack of understood relevance. Formal education must adapt to this shift in learning style just as it had to adapt from the Industrial Revolution model of education to the Information Age (Hu-Au & Lee, 2018). Developing the Riverside Virtual Learning Center (RVLC) into an after school program provides students with necessary educational tools for relevant experiential learning. This program will train students to be leaders and educators in virtual reality (VR) equipment usage. Student leaders will also research and identify appropriate VR educational programming to support learning. Student leaders are then able to educate their peers, and teachers, on educational programming that may be used across all content areas. Finally, students will have access to VR centers at top universities (Yale, Harvard, MIT, etc.) to support future success in classrooms and careers.

Adapting appropriate learning in the Experience Age requires formal education to overcome three significant challenges. First, Capps and Crawford (2013) identify that students are disengaged from continued passive lectures by teachers. For students, passive lecturing fails to show context or relevance to students' lives, and they struggle from a lack of context (Gee, 2009). Second, authentic learning has not been incorporated adequately into classroom learning (Hill & Smith, 2005). Finally, Smith & Hu (2013) identify difficulty teaching and developing skills in empathetic experiences, systems thinking, exercising creativity, computational literacy, and visualizing abstract reasoning. These skills are crucial to the educational development of 21st-century learners.

There are three important considerations regarding the Riverside VLC After-School Program. First, the VLC will continue to engage our students in their learning within a fully immersive environment, challenge our students academically while providing a full-body learning experience. Second, through this funding, a core group of students will

be trained as student leaders to effectively introduce and educate all students, and other teachers, in the use of VR program learning with the intent to build a district-wide VR program. Finally, the school and district can build partnerships and relationships through Virtual Learning Centers with prestigious universities including Yale, Harvard, and MIT, local districts such as Greenwich and Derby (currently developing similar programs), and sister schools (Davis, Truman, and Conte) who have expressed interest.

The Oculus Quest 2 Learning System has applications in science, math, history, geography, architecture, and art (where it will allow a once-in-a-lifetime opportunity for artists to work in a brand-new medium). Virtual reality (VR) provides a fully immersive three-dimensional environment requiring body movement and visual feedback as part of our students' learning. (Aarseth, 2001). Also, market researchers argue that VR is poised to be a trillion-dollar industry by 2035 (Boyle 2016). Virtual reality provides the opportunity to successfully engage students in these growth areas. Sustained learning is supported by research through Hu-Au & Lee (2018) from Teachers College, Columbia University, with Călin (2018) identifying how students with disabilities have improved learning experiences through the immersive interactive environment of virtual reality.

In implementing learning through VR, and expanding into an after-school program, we meet our students where they prefer (Wadhera, 2016). The RVLC has accomplished this learning with authentic, multi-sensory experiences allowing learning to come alive (Hu-Au & Lee, 2018). VR learning at Riverside has increased students' academic engagement, learning, and personal development as supported by research from Delialioglu (2012) and Winn et al. (1997). The RVLC has also increased interest in technology and subject matter allowing for shared experiences and deeper classroom discussion to improve student engagement (Ferriter, 2016). VR can also inspire minority and female students encouraging them to pursue careers in occupations where they are historically underrepresented or in fields normally inaccessible (Butler, 2003; Dalgarno and Lee, 2010). Finally, in engaging with VR centers at Yale, MIT, Cornell, NYU, and Harvard, we can guide students towards careers in Science, Technology, Engineering, Arts, and Mathematics (STEAM) (Hu-Au & Lee, 2018).

The pandemic has allowed for a more formal introduction to technology. The implementation of computers and online learning helped keep education and the available tools relevant (Hu-Au & Lee, 2018). However, it exposed a glaring disconnect between how teachers impart information and our students' preference for receiving it. Understanding our students' disconnect to their learning identifies the need for continued expansion and development of the Riverside Virtual Learning Center (RVLC) After-School Program to support learning. Students have successfully engaged in virtual learning over the last few years; however, limitations have occurred due to few available headsets. By expanding this program, we can reach more students through cross-content student-centered learning to support their core courses.

The RVLC After-School Program supports the experiential learning needs of our 21st-century students while also meeting the educational and technology goals of the New Haven Public Schools (NHPS) and the Connecticut State Department of Education (CSDE).

In supporting the mission and vision of the CSDE as our students benefit from the full potential of technology. Our students will receive personalized learning through impactful teaching with resources supporting the effective use of technology for all learners (CSDE, 2021).

The RVLC supports the mission and vision of NHPS as a premier urban school district by providing an equitable opportunity to prepare for college, career, and life. Virtual learning is personalized while providing authentic and engaging learning experiences. Our students will learn through high-quality instruction encouraging creativity, exploration, and innovation. Our students will also utilize deep critical thinking and problem-solving skills paramount to

a quality education. The RVLC also fosters a culture of continuous improvement through collaborative partnerships with, peers, staff, other school districts, and top academic universities (NHPS, 2021).

The RVLC also supports the overarching goals of the NHPS 2020-24 Strategic Plan. The RVLC meets Goal #2 by providing relevance to our students' learning through technology to support literacy, math, and science gains. Also, relevant technological education may improve 6-year graduation rates for our high-needs subgroups through relevant instruction. The RVLC supports Goal #3 through technology learning programs to support whole child development in social-emotional and physical wellness while encouraging increased attendance through student-relevant learning opportunities. Goal #4 is supported through partnerships with VR centers in leading universities and other school districts. These partnerships can help prepare students for post-secondary success opportunities. In supporting Goal #5, RVLC supports our students' equity, growth, and progress by meeting the learning demands of 21st-century learners through advanced technological programs.

Expanding the Riverside Virtual Learning Center to an after-school program will provide opportunities for more student engagement. The RVLC will continue to fully immerse and actively engage our student's minds and bodies while providing learning and leadership opportunities to improve their involvement, and performance levels, in school. All students, across cultures and varying disabilities may utilizing this technology which can help to improve attendance and reduce dropout rates due to authentic learning experiences while identifying future technology-related career opportunities. Finally, student leaders will continue to develop their skills as trainers, partner with sister schools, other suburban school districts, and prestigious universities to provide challenging opportunities to encourage success in high school, college, and beyond.

Examples of appropriate educational programming:

Tilt Brush – students can paint, sculpt, and create fashion, or design life-sized models of three-dimensional architecture or landscapes (Tilt Brush, 2016). <https://www.youtube.com/watch?v=TckqNdrdbgk>

The Body VR – students are a red blood cell navigating the bloodstream of the human body.

<https://www.youtube.com/watch?v=5PYmRfPIWyQ>

You by Sharecare – Students immerse themselves in the medically accurate human body understanding organs, diseases, and medical procedure treatments for the human body.

<https://www.youtube.com/watch?v=CFXpZ0xeJQ8>

VR Language Learning and Public Speaking VR - students may practice public speaking in highly immersive experiences without fear of mistakes. https://www.youtube.com/watch?v=nr_sJljwLso

Gravity Labs – Students learn physics through gravity bending VR puzzle games.

<https://www.youtube.com/watch?v=f1KRxVTGaJE>

Home: A VR Spacewalk - Students learn weightlessness in space to develop interest in aeronautical engineering and aerospace.

<https://www.youtube.com/watch?v=VvuI2V7XwEI>

Walk on Mars – developed from NASA rover pictures, take a walk on Mars to develop interest in aeronautical engineering and aerospace.

<https://www.youtube.com/watch?v=f1KRxVTGaJE>

Google earth VR – See the whole world from space to street view.

<https://www.youtube.com/watch?v=SCrkZOx5Q1M>

Travel videos – Allows students to take brain break field trips all over the world from cities, to landmarks, to animals and natural sceneries all from the comfort of the classroom.

<https://orbitian.media/>

VR chat – allows students to develop their social interactions and lessen social anxiety, experiment with identity, build their own worlds and invite people to them.

<https://hello.vrchat.com/>

Van Gogh “The Night Café” and “Starry Night” – Students can walk through Van Gogh’s paintings.

<https://www.youtube.com/watch?v=yal2WBEZ5el>