DETROIT, Mich. – Lightweight Innovations for Tomorrow (LIFT) and Tennessee Tech University (TTU) hosted students from college prep school Detroit Institute of Technology at Cody in Detroit on September 30, 2015 to experience its newly-unveiled, world-class “LIFT Assembly Line” Virtual Reality (VR) game, illustrating the power of lightweighting in the automotive industry. The event was held at LIFT’s headquarters in Detroit’s Corktown area.

The day’s activities launched the new VR system at LIFT. The LIFT Assembly Line utilizes an innovative VR technology that allows users to experience a manufacturing floor as if they are part of the production process.

“We can talk about the power of lightweighting but there is nothing like touching and feeling it, including virtually,” said Larry Brown, executive director, LIFT. “This incredible learning tool, created by TTU, brings the automotive production process into the classroom with technology and an approach that will truly engage our future workforce and others.”

The competition-style VR demonstration game pitted participating students against one another to see who could manufacture the car that traveled the farthest utilizing lightweight parts. Wearing Oculus Rift goggles, participants moved through LIFT’s virtual reality automotive assembly line as parts were released around them on a conveyor belt. Four options for each part of the vehicle varied by type of materials used, the ideal being the lightweight manufacturing option.

“Engaging today’s youth at an early age with fun and exciting technology like virtual reality is imperative as we aim to stimulate students’ interest in the opportunities and educational pathways that lead to rewarding, in-demand advanced manufacturing jobs,” said Emily DeRocco, education and workforce director, LIFT. “We’re thrilled at the prospects for learning and engagement not only for students but also industry partners.”
LIFT begins its use of VR as a learning tool with 7 computer stations equipped with TTU's VR program and sets of Oculus Rift goggles. The technology experience will ultimately be available to thousands of students, teachers, industry partners and other LIFT visitors. This could be the beginning of a new format not only for students but also for industry to train its workers without having to travel. Virtual reality is a new frontier in manufacturing education and training.

"It has been quite rewarding to partner with LIFT and bring our innovative iCube-developed virtual reality content to Detroit," TTU President Phil Oldham said. "This tech platform truly is going to change how people and our young generation view advanced manufacturing. The iCube environment at TTU changes the way we educate and train our tech-savvy students, who will be outstanding when they enter the workforce, in this continuously changing world of information technology. We are all about what iCube stands for — imagine, inspire and innovate."

For more information about LIFT and TTU’s VR technology, and other LIFT education and workforce development initiatives, please visit www.lift.technology or contact LIFT Workforce & Education Director, Emily DeRocco, at ederocco@lift.technology.

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ABOUT LIFT

Lightweight Innovations For Tomorrow (LIFT) is a public-private partnership that will develop and deploy advanced lightweight materials manufacturing technologies and programs to prepare the workforce. The LIFT region includes 5 states: Michigan, Ohio, Indiana, Kentucky and Tennessee.

LIFT is operated by the American Lightweight Materials Manufacturing Innovation Institute (ALMMII) and was selected through a competitive process led by the U.S. Department of Defense under the Lightweight and Modern Metals Manufacturing Innovation (LM3I) solicitation issued by the U.S. Navy’s Office of Naval Research. LIFT is one of the founding institutes in the National Network for Manufacturing Innovation, a federal initiative to create regional hubs to accelerate the development and adoption of cutting-edge manufacturing technologies.

ABOUT TENNESSEE TECHNOLOGICAL UNIVERSITY

Tennessee Technological University's mission as the state's only technological university is to provide leadership and outstanding programs in engineering, the sciences, and related areas that benefit the people of Tennessee and the nation. The University also provides strong programs in the arts and sciences, business, education, agriculture and human ecology, nursing, music, art and interdisciplinary studies. Tennessee Tech serves students from throughout the state, nation, and many other
countries, but it retains a special commitment to enrich the lives of people and communities in the Upper Cumberland region of Tennessee. Tennessee Tech University is consistently recognized as the state’s top public regional university by U.S. News & World Report and as one of the top universities in the South. TTU is the top value-added public university, and TTU graduates have the highest mid-career salary potential of any public university graduates. Through iCUBE environment, where students and faculty imagine, inspire, and innovate while using immersive reality technologies to bring projects to life, both virtually and organically, TTU advances collaborative solutions for business, community, and economic development.
BUILDING 21st CENTURY MANUFACTURING TALENT
LIFT Assembly Line: Virtual Reality Lightweight Manufacturing at LIFT HQ
An Education & Workforce Development Initiative for LIFT...Lightweight Innovations for Tomorrow

THE PROBLEM
Lightweight metals and lightweighting technologies are most often talked about in R&D settings, on the manufacturing floor, and in the lab. Students do not often have the chance to learn about these materials and new technologies that are becoming more and more important in advanced manufacturing, particularly in the defense and commercial transportation sectors. Without early experiences in advanced manufacturing or with new technologies, many students will not choose to go into high-demand manufacturing careers as engineers or other skilled high-tech workers.

This is especially a problem for high-tech manufacturers in the sectors poised to use new lightweight metals, composite materials, and related technologies. Without innovative techniques to reach students on their level, the industry may be at a loss for skilled talent in the future.

THE SOLUTION
Using its world-class virtual reality lab, Tennessee Tech University has created a virtual assembly line game focused on lightweighting in the automotive sector. Students and visitors at LIFT HQ will be able to build their own vehicle, choosing among different components to create the ultimate lightweight machine. Students and other users will learn about different materials and how they contribute to the overall performance, e.g., speed and energy consumption, of a lightweight vehicle. This virtual reality game is only the beginning of a new frontier in advanced manufacturing training.

PROJECT DESCRIPTION
At a computer station, students will be transported from LIFT HQ onto the manufacturing floor to build a custom vehicle. Students will work along an assembly line, selecting parts on a conveyer belt, to create a lightweight automobile. At each conveyer belt station along the assembly line, students will have to choose between four different materials, with a goal of selecting the lightweight option. The overall goal of the game is to create the ideal lightweight vehicle, with points assigned based on the vehicle weight and distance traveled.

The LIFT Assembly Line launched as part of the Manufacturing Day 2015 activities in Detroit, Michigan. Thirty students from a local Detroit high school began their Manufacturing Day celebration and talent tour by stopping in at LIFT to test out the new virtual reality game and talk with engineers about their careers in manufacturing. These students put their lightweighting knowledge to the test to create customized vehicles using the technology created by Tennessee Tech University.

LIFT visitors will be able to test the new technology while at the headquarters in Detroit. Industry partners along with workforce and education partners are invited to try the game. The virtual reality lab is not just a game for LIFT; it puts LIFT at the leading edge of advanced manufacturing education, training, and development with industrial application opportunities. It is truly a 21st century technology for developing 21st century talent.
EXPECTED OUTCOMES

Thousands of students, teachers, industry partners, and other LIFT visitors will be introduced to lightweighting through the LIFT Assembly Line game. This initiative’s creative use of technology will no doubt bring lightweighting ideals into the minds of future advanced manufacturing workers and attract new talent to the field.

NATIONWIDE IMPACT

The LIFT Assembly Line game will be available for all LIFT partners and visitors to use. It will serve as one of the first of many virtual reality-based teaching tools to bring advanced manufacturing to students around the world. Virtual reality technology brings LIFT to the forefront of manufacturing education and manufacturing processes. The ability to transport a student onto a factory floor without having to travel brings manufacturing to life for students who may not otherwise have the experience.

Virtual systems have great potential to not only increase student awareness and interest in manufacturing but also dramatically alter the way industry trains its own workforce. Companies can adopt these technologies to demonstrate new products and integrated manufacturing techniques for workers in any location. New assembly systems can be created and tested virtually before machinery is physically built. The game is just the beginning of a future where virtual learning, training, and R&D are the norm.