The main goal of this Showcase session is to exhibit an immersive Virtual Construction Lab (VCL) game that enables students to put together building assemblies such as a wall using conventional materials and methods. With the increasing levels of difficulty, students can pick materials and install them virtually using tools and support systems such as a ladder to build, for instance, an exterior wall with CMU blocks, and aluminum angles with terracotta rain screen. The main goal is to offer a Virtual Reality (VR)-based environment to simulate a construction lab that allows students to construct and install building assemblies without wasting materials and energy and without compromising their safety. A scoring and reward system improves motivation toward learning within a gamified setting. The VCL prototype can act as a transition from training in a safe and organized academic setting to a highly risky, chaotic, and stressful construction job site environment. Such a gradual transition may better prepare them to be safer and more cognizant of safety hazards and more productive in contributing to the construction sector’s growth.