



VIRTUAL RISKS, REAL REWARDS:

ENHANCING CONSTRUCTION SAFETY WITH VIRTUAL REALITY

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The Safety Training Landscape

Costs equivalent to four percent of global GDP and 337,000 fatalities annually, that's the best current training processes and normative standards have been able to achieve. For the construction industry, where one in five workplace fatalities happen, maintaining the status quo means 19 workers every week go to work and don't come home. Unfortunately, the safety industry has been slow to adopt new solutions that could help reduce workplace incidents despite the

waves technological innovation has made in many other sectors. Emerging technologies like virtual reality (VR) and augmented reality (AR) are seriously improving the training landscape by adding needed enhancement to a safety curriculum that is chock-full of essential content, but that lacks either an active, engaged presentation style or the on-site experience where the skills are practiced (or not) on a daily basis.

Enhancing traditional construction safety training, such as OSHA-required courses,

with immersive VR/AR experiences leads to increased student engagement, higher pass rates and better retention. Generations growing up playing video games and interacting with visual technology especially succeed as they learn by doing — a universal language — in a controlled environment that puts them in “virtual danger” before they are in any actual danger on a jobsite. Frank Marascia, a Certified Instructor for the United Safety Academy explained, “At a time when classroom training is mandatory in a predominately hands-on industry, VR

allows our students to better visualize what they're learning and directly apply it without leaving the classroom. Why try to explain by words alone what we all have to go out and actually do, with all of the very real hazards and risks?"

Letting Experience Lead the Way

It shouldn't be that the first-time workers practice skills like driving a fork lift or operating a crane is on-site. Inexperience does not lead to the best outcomes. Printouts and lectures in English (a second language for many) are not adequately preparing them. As Marascia put it, "In the construction industry we learn by doing. Why wouldn't we do the same with our safety training that's required for all workers? VR makes that possible." To prevent incident and injury, workers must be trained to think on their feet in nuanced situations requiring prior knowledge of potential complications and experience-driven training.

Award-winning educators apply learning styles that feature interactivity and student participation. The best safety trainers know this too — they go the extra mile to expose their trainees to the realities of the jobsite, including when safety precautions and best practices are not followed, for whatever reason, the results can be painful, costly, and even fatal. Instructional tools must follow suit to increase engagement with real-life construction scenarios where workers have multiple opportunities to get it right without risk to themselves or their coworkers. By training for the job, not on the job, companies are able to save time and money and avoid potential injuries that may occur while employees are still getting their bearings with new equipment or processes.

For Michael Ivancich, the director of training at Safety Group, LTD, VR-enhanced safety training presents a simple extension of methods he already champions. "When I go out to teach my crew how to safely erect a scaffold, I bring a scaled-down version of the real thing," he said. "Why? Because interaction and experience are the best teachers. But, I couldn't reasonably have my trainees risk life-threatening electrocution while reviewing lockout-tagout procedures. For those situations VR lets them go through the steps of the training over and over, but without any actual danger or additional costs. The kicker is that the students have a bit of fun while using the VR, which contributes to their usage and retention."



Plugging the Construction Skills Gap

The gamification of learning in highly realistic virtual environments has the added benefit of attracting new talent to the construction industry, which is currently facing a qualified labor shortage. As the construction industry continues to see growth, so do the costs, with rising labor rates stemming in large part from an industry-wide supply gap for skilled, certified labor. With almost 200,000 unfilled openings and over 20 percent of the construction workforce facing retirement in the next 10 years, the industry needs to attract and properly train a new generation of workers. Due to its innovative approach behind an experience-driven curriculum, VR training proves to greatly enhance classroom training, driving engagement for an otherwise compliance heavy landscape that's off-putting to younger generations.

Jermaine Hunter, Ph.D., a veteran safety professional and instructor from Maryland, noted, "With over 23 years working as a safety trainer, I've seen first-hand how the newer generation are attracted to the VR training. They get into it like a game and it gives them instant feedback to see the results of their decision making."

Instructors and companies benefit as well from the automated performance records and reports, which allow for greater transparency as to what has and has not been learned. Safety managers, trainers, and HR departments then have more actionable data about their workers' safety training and performance. Hunter added, "The thing that I found that makes it most effective is that it puts people in real-world situations. When coupled with a great curriculum it really connects the dots for the users. Then, when

they're back in the real world the actions are stored in their memory so that when they encounter a situation they know how to act."

VR Best Practices

VR-based safety content is especially useful for aptitude tests, situational screening, and behavioral conditioning. "Anything that's too boring, too risky, or too costly to do in real life," adds Daniel Stein, VR Product Manager for NextWave Safety Solutions, a New York-based safety services and training provider that generates VR content for its clients and courses. Virtual scenarios can lead trainees through site safety investigations, through the operation of heavy machinery, or step by step through standard operating procedures and the dangerous reality of what happens when through impatience, negligence, or ignorance, the protocols are not followed. For these virtual trainings to hit their mark, however, industry veterans and safety professionals need be part of the design process. Providers should work hand in hand with HSE professionals, union halls, vocational/technical schools, and even their regional OSHA offices to ensure this new, powerful training platform enhances the skills required to allow a new generation of workers to create safer construction sites than ever before.

NextWave is an integrated safety solutions company innovating risk mitigation, workforce training and analytics through technology. Our core foundation in professional safety services saves lives and generates material cost savings for our clients. For more information, find us at www.NextWaveWorks.com. ■