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The Benefits of Simulation Training in Education

Deliver Superior, Safer Training and Inspire More Students to Access In-Demand Careers

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> “Students get on the simulator and don’t want to leave the room.”
>
> **Mario Leduc,** Assistant Director
> Mont-Laurier Vocational School

The Benefits of Simulation Training for Educational Institutions

What would happen if you could train students 2.5 times faster? Or cut training costs in half?

Over the past few decades, simulation has emerged as a new approach to training novice equipment operators. Modern simulation technology creates an authentic, immersive experience that translates to real-world skills in the field. Whether handling equipment in confined spaces or managing heavy equipment in poor weather, operators who have trained on a simulator approach their work with added confidence and a strong skill set.

For early adopters, it’s a solution that has had a profound impact on their organization. By integrating simulation into its training program, for example, Baker Technical Institute (BTI) was able to lower its costs and speed up student training times. “I couldn’t imagine building a heavy equipment operator school without simulators,” said Doug Dalton, President of BTI. “The cost of running the program would easily be three times higher without them.”

In this ebook, we’ll review the many benefits of simulation training, exploring how an intelligent simulation training system can advance the goals of colleges, technical institutes, and other places of learning as they prepare students to quickly, safely, and successfully join jobsites and launch rewarding careers in heavy equipment operation.

What Is a Simulation Training System?

Today's simulation training isn't just about simulators. It's about engaging with an entire system that can span multiple sites and easily scale up with an organization's needs. Facilities can choose the combination of training packs, simulators, and instructor tools that best fit their needs, to build a system that is wholly their own.

Equipment training packs

These delivery specialized training for different pieces of heavy equipment—such as digger derricks, excavators, cranes, dump trucks, and boom trucks. Each training pack focuses on a single machine type and includes a series of exercises and scenarios that progress in difficulty. These exercises increase in complexity as operators build their skills and learn to apply them in different contexts. Simulations replicate real-world equipment and real-world physics, responding to operator actions in a true-to-life way.

Training management and instructor tools

These are advanced tools that allow trainers to access detailed performance data, monitor multiple students simultaneously, inject machine malfunctions into exercises, and create custom learning paths. Instructors can even use these tools to simplify training administration by exporting files in bulk with a single click and integrating their simulation system with their learning management system, such as Moodle or Blackboard.

Simulators

These are high-fidelity hardware, equipped with real OEM-grade controls, capable of running detailed simulation training packs and integrating with training tools. Simulators can even include motion platforms for additional realism.

Realism Builds Real Skills

Realism matters when it comes to simulation training. Without authentic machine feedback, a student might incorrectly believe that driving a compact track loader with a raised, full bucket won't tip when doing a sharp turn. These types of mistakes are the result of something called "negative training," training that teaches students to follow incorrect cues or believe that unsafe maneuvers aren't dangerous.

A simulation training system that behaves like real equipment, on the other hand, helps students develop skills that are directly transferable to the jobsite. CM Labs provides the most realistic simulation training in the industry, backed by decades of award-winning research. We accurately simulate the transmission, suspension, and engine torque of equipment. We also precisely model the way soil moves and spreads. Our cables swing in the wind, our equipment tips when improperly handled, and our simulated dirt behaves just like the real thing. Without dependable realism, skills would not properly translate to the real machine, calling into question the entire point of a simulator.

Reduce Training Risks and Increase Safety

When an operator, whether they are training as a student or in the field working, makes a mistake on a piece of real equipment, the consequences of that mistake can be catastrophic. For the well-being of students in class and throughout their careers, safety remains a top priority. Simulation training helps lower risk and foster a safer educational experience in several ways.

Safe, risk-free training

When sitting on a simulator, students can make mistakes and learn from them without the fear of causing real-world harm to themselves, others, or the equipment.

A safe way to practice high-risk scenarios

Simulation training systems allow students to safely practice high-risk scenarios—such as experiencing equipment beginning to tip—so they can learn how to respond effectively to situations that are simply too dangerous to practice on real equipment. Students can even experience inclement weather, machine malfunctions, and dangerous conditions to prepare for the unexpected.

Better performance tracking & benchmarking

Instructors can track student progress with objective performance metrics and reports, enabling instructors to identify skill deficiencies before they become a risk when training on real equipment.

> “You can have an accident in the simulator and nobody gets hurt. You can learn a lot without suffering the consequences that you would suffer in the real crane.”

Jim Headley, CEO and President
Crane Institute of America

Make it Easier for Instructors to Do What They Do Best

Your instructors are your greatest asset, and with simulation training, they have even more resources and opportunities to share their expertise and maximize training value.

> Simulation training does a brilliant job of allowing for corrective training on the spot. You don't have to come down off of a crane and go into a classroom. The instructor can provide corrective training right then and there while literally standing next to the student.

John Kelly, Training Center Manager
The National Construction Training Center in Mount Lucas

Better corrective training

With simulation training, it's easier for instructors to stand beside students and offer direct guidance, even grabbing controls to show precise movements. This allows for better corrective training and knowledge sharing.

Easier collaborative learning

With simulation, it's possible to link different simulators together to conduct team-based, multi-machine, and multi-role training, such as signalperson training, tandem lifts, and crew training. This helps instructors teach collaboration and helps students practice communication and prepare for team-based work after graduation.

Flexibility to provide personalized feedback

Instructors can adapt simulation training to fit the individual needs of students. Instructors can use data to uncover individual strengths and weaknesses. They can also craft custom learning paths, making it easier to adapt training to each student.

Enhanced certification preparation

Instructors can use simulation to easily prepare students to pass their certification exams. With practice test courses and dedicated preparation, simulation training can help students prepare for their exams quickly and safely.

Inspire Young People to Pursue a New Career

Simulation training has proven itself as an engaging recruitment tool. At recruitment events, for example, many schools have found success using simulators to grab the attention of attendees and start conversations about the careers they can unlock.

> There is a new pool out there that doesn't come from a construction or agriculture background. If you ask a 17- or 18-year-old to jump on a real machine and drive it, they'll be terrified. But with a simulator, they know they can't do any damage or make a show of themselves. Simulators are creating a new pathway to construction.

John Kelly, Training Center Manager
The National Construction Training Center
in Mount Lucas

Differentiate your school from other education options

Simulators help set your institution apart from other organizations. With a simulation training system, you can demonstrate to prospective students that they'll receive an exceptional, cutting-edge educational experience from an organization that is investing in their future.

Build excitement and interest

Simulators are known to draw a lot of attention at job fairs and other recruitment events, particularly among younger generations. This helps boost recruitment and fill classes.

Support digital marketing

Filming sessions on simulators and taking pictures of simulator-equipped classrooms to share online and on social media can help generate interest through digital channels, attracting more students to your program.

Recruit from non-traditional and under-represented demographics

Simulators can provide a pathway to construction for underrepresented groups. Organizations all over the world are using simulation to encourage more women, veterans, and underrepresented demographics to explore careers in heavy equipment operation.

Build Synergy with Local Industry

Whether connecting students with career opportunities or offering to deliver employee training, simulation training tools help schools stand out when connecting with local employers. Sophisticated simulation training tools with Trimble capabilities, multiple attachments, and complex scenarios provide opportunities for the advanced training employers look for.

Train Faster

Educational organizations can train operators to proficiency much faster with simulation training systems than on real equipment alone. In fact, 12 hours working in a simulation training system can equate to up to an entire week of training on real equipment. Simulation training systems accelerate training times in several different ways.

> “Now with Intellia, we can set specific time blocks. We can tell students, ‘Hey, you’ve got an hour and you have to complete these specific tasks, which you’re going to be graded on.’ Before Intellia, we didn’t have that ability.”

Daniel Cooper, Curriculum Manager American Line Builders Joint Apprenticeship and Training Committee (ALBAT)

Train in all weather conditions

Simulation training systems are available 24/7 in rain, snow, and hot weather, which eliminates delays caused by poor weather conditions.

Larger teacher / student ratios

A single trainer can simultaneously instruct many students, unlike the one-on-one approach required with real machines. With a simulation training system, it’s easy for an instructor to demonstrate a complex maneuver while students stand behind the simulator and observe their actions.

Easier training management & reporting

Student training can be reinforced through quantitative measurement of student performance, making it easier to objectively evaluate progress.

Added flexibility

Instructors can set custom learning paths and scoring thresholds in their simulation training system. This allows instructors to step out of the classroom and focus on students training on real equipment, while students in the classroom complete a set series of exercises.

Self-guided learning

Teachers can assign time on simulators as homework, then review metrics from these training sessions to confirm how long students spent training, how well they did on exercises, and how their abilities are evolving over time.

45% - 70% faster training

hours on simulator

12=1 **week** training on real equipment

Reduce Costs

A simulation training system lowers operating costs for educational organizations. These cost savings add up, with many organizations reporting a 50% or higher training cost reduction.

> I couldn't imagine building a heavy equipment operator school without simulators. The cost of running the program would easily be three times higher without them.
>
> **Doug Dalton**, President
> Baker Technical Institute

Using fewer machines for training

Because students can learn fundamental skills in a simulated environment, educational organizations require fewer physical machines to train students. Those machines can then be used to teach technicians rather than operators.

Shortening setup and cleanup times

When training students on a simulator, instructors eliminate setup and cleanup times. All it takes to prepare a test course is the touch of a button, significantly reducing the amount of time and resources that need to be allocated to preparing training grounds. Instructors can also switch between different equipment types in under a minute with the help of hot-swappable controls.

Grant funding available

Many schools are able to apply for and receive grants to fund the purchase of training simulators.

Reduced insurance costs

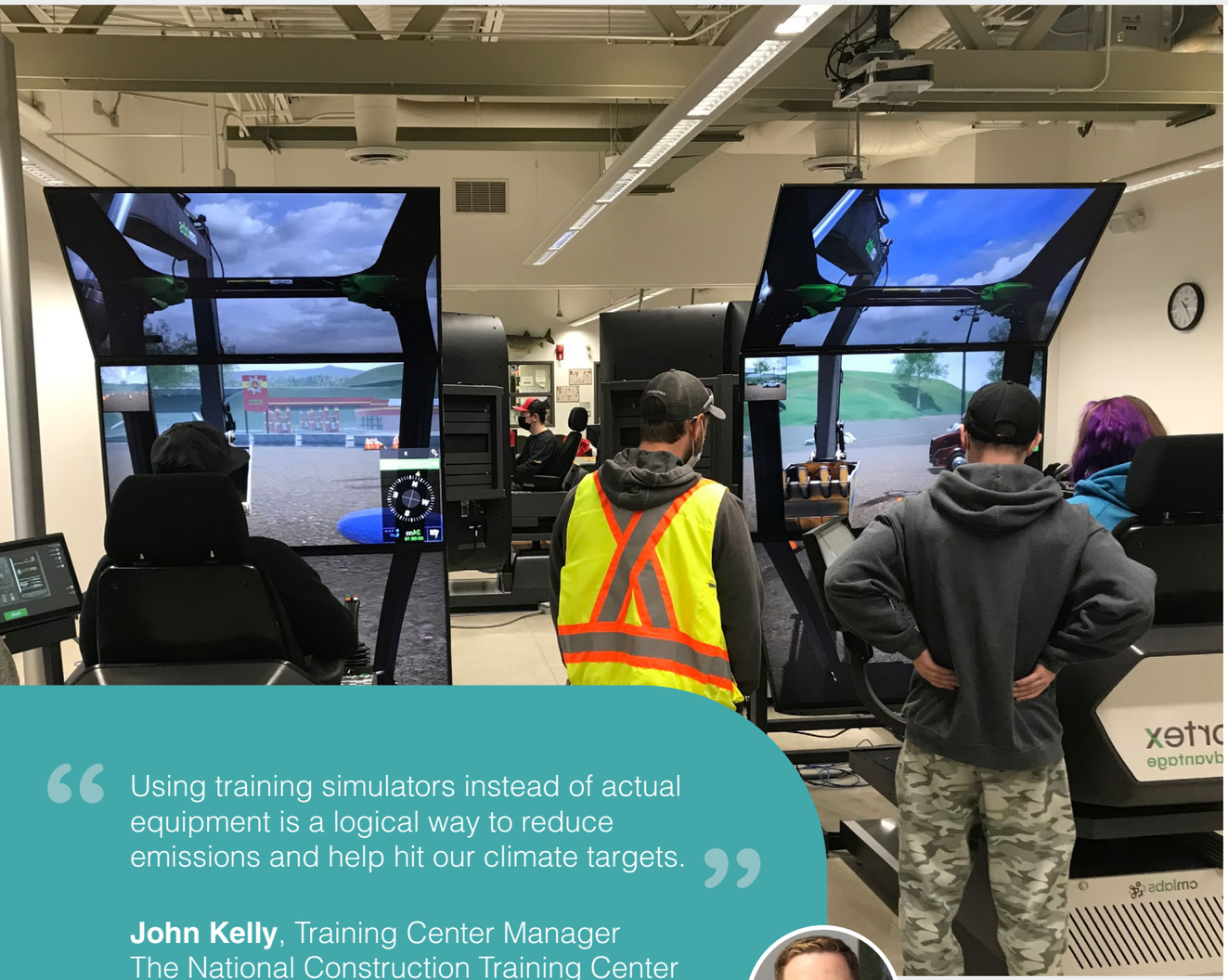
By reducing accidents and incidents, organizations using a simulation training system may be able to negotiate reduced insurance premiums.

Less wear on equipment

After completing their initial training on a simulator, students step into the cab with more experience, reducing accidents and harsh maneuvers that necessitate repairs. With fewer machines used for training, equipment experiences less wear and tear and burns less fuel, lasting longer and costing less.

Accelerated training lowers training costs

Simulation training systems accelerate training time overall, allowing organizations to train more students faster, driving up revenue while also increasing organizational efficiency.



> Using training simulators instead of actual equipment is a logical way to reduce emissions and help hit our climate targets.

John Kelly, Training Center Manager
The National Construction Training Center in Mount Lucas

Cut Emissions

Simulation training helps educational institutions lower their carbon footprint.

Lowered emissions during training

By reducing the number of real machines being used, organizations can cut down the amount of fuel they burn.

Reduced idle time and fuel consumption

Simulators can help teach students how to use heavy equipment with less idle time and greater efficiency. This results in less fuel consumed and greater cost savings when using real equipment.

1/2 the **cost** of traditional training

Simulation Training Benefits Instructors, Students, and Schools

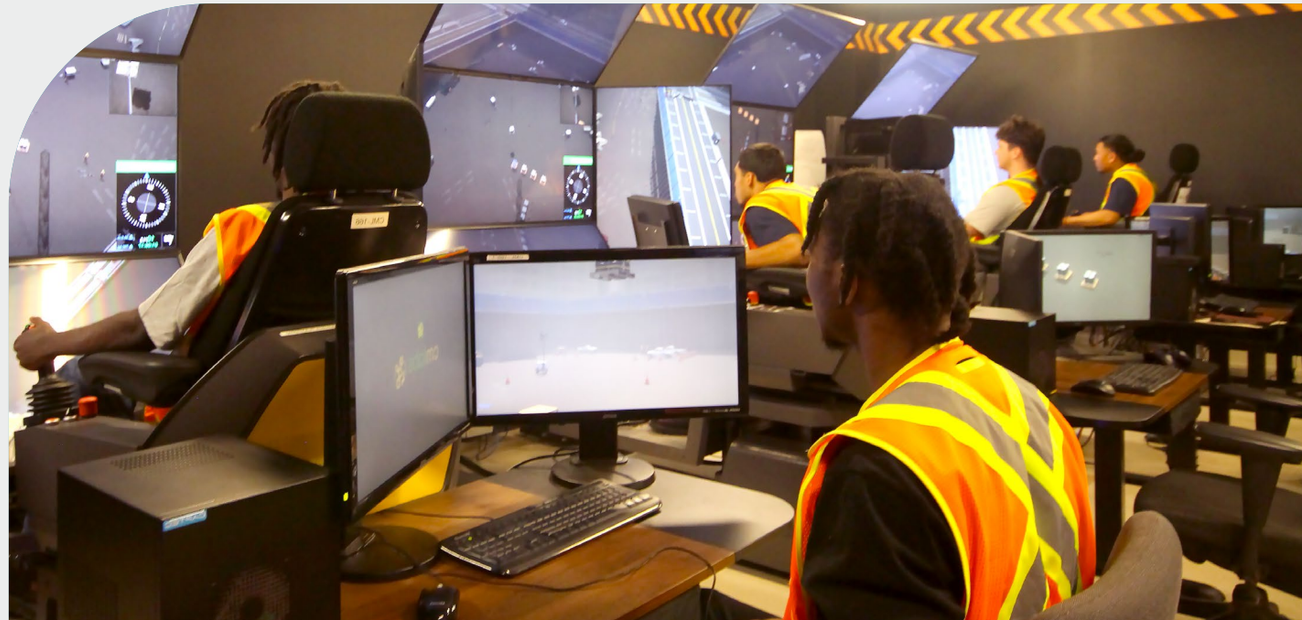
> “Remember, no one can get hurt on these machines.”

Danial Haddad, Executive Director
SELCAT

Simulation Training Provides a Competitive Advantage

Working with heavy equipment will always present hazards, so it is essential that educational institutions make every effort to prepare students safely. For many, simulation training has emerged as a clear answer.

By embracing a new approach to equipment training, educational organizations can recreate live experiences with shocking realism and develop the necessary skills for success. Students can focus on learning the machines without the risk of injury or damage. They are free to make mistakes and grow from them. The end results are safer training programs, greater savings, and a better experience for all.



References

Construction CTE Insider Explains How Simulation Technology Revolutionizes the Industry, CM Labs Simulations

CM Labs Smart Training Technology: Real-World Operator Experience for Next Gen Equipment Training, CM Labs Simulations

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