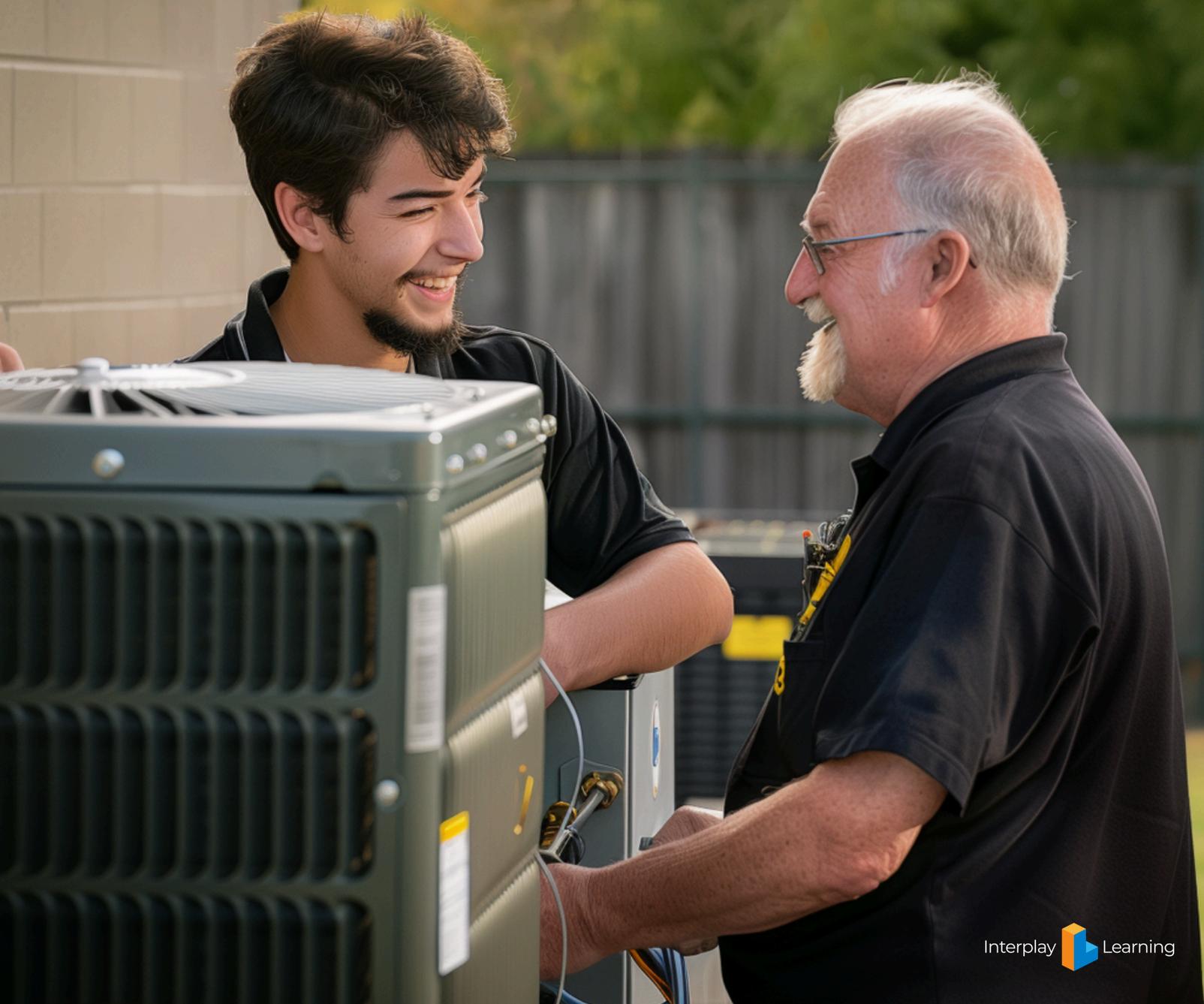


# The Four Pillars of Workforce Development for the Trades

Case Studies, Insights, and Best Practices for Skilling the Next Generation of Trades Professionals





## An Old Industry Faces New Challenges

A staggering 91% of contractors are having difficulty filling some or all positions, according to the Associated General Contractors of America.<sup>1</sup> The reason? According to 75% of contractors, it's because available candidates aren't qualified to work in the industry.

As the demand for skilled trades professionals continues to rise, workforce development programs can play a crucial role in bridging the skills gap.

With an aging population, the skilled trades need a new generation to rise up and enter the field. In some cases, high school graduates and young adults are looking to jump straight into a hands-on, rewarding career. In other cases, it's adults pivoting and reskilling from another field into the trades.



## A Growing Skills Gap

The U.S. construction market is expected to grow 26.4% by 2029 and reach \$3.11 trillion.<sup>2</sup> All of this growth means that demand for skilled labor will also continue to grow. Not only are these good jobs, but filling these roles is essential for the upkeep and growth of our communities.

## Hard-to-Fill Trades Positions<sup>1,3</sup>

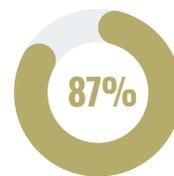
### Electricians



*Skills shortage:*  
**79% of employers report difficulty hiring**

*Projected growth:*  
**6% by 2032**

### HVAC Mechanics and Installers



*Skills shortage:*  
**87% of employers report difficulty hiring mechanics, 83% for installers**

*Projected growth:*  
**6% by 2032**

### Plumbers



*Skills shortage:*  
**82% of employers report difficulty hiring**

*Projected growth:*  
**2% by 2032**

### Heavy Equipment Operators



*Skills shortage:*  
**83% of employers report difficulty hiring**

*Projected growth:*  
**3% by 2032**

### General Construction Laborers



*Skills shortage:*  
**76% of employers report difficulty hiring**

*Projected growth:*  
**4% by 2032**



## The Four Pillars of a Workforce Development Program for the Trades

Nonprofits and workforce development programs can bridge the gap between market needs and employee skills by building career-readiness training programs. Immersive learning tools, flexible structures, and local partnerships are key to establishing solid programs that align with learner preferences—and employer needs.

In this paper, we'll lead you through the four components that make a successful workforce development program, with case studies to lead the way.

### PILLAR 1

#### A Flexible Training Program

Find the right mix of online, hands-on, and in-person training.

### PILLAR 2

#### Credentialing and Certification

Equip learners with industry-recognized certifications.

### PILLAR 3

#### Safety

Minimize risk while maintaining hands-on, immersive training.

### PILLAR 4

#### Employer and Community Partnerships

Align your programs with local needs and organizations to increase your impact.

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## Pillar 1: A Flexible Training Program

The first pillar of an effective workforce development program in the construction trades is flexibility in training formats. Today's learners, especially adult learners, have diverse needs and schedules. This requires a training program that offers a blend of online, hands-on, and in-person formats, accommodating different learning styles such as kinesthetic, auditory, and visual.

### Benefits of a Flexible Training Program

- Affords adult learners the flexibility to work around jobs and caregiving responsibilities
- Boosts skills acquisition by allowing learners to revisit content, practice in virtual environments, and gain instant feedback with knowledge checks
- Complements classroom and lab time by allowing some learners to complete online modules while others work 1:1 with an instructor, or creates an option for a 100% self-led learning experience
- Allows learners to work as fast or slow as they like with self-paced modules
- Limits costs by minimizing the need for expensive equipment and classroom space

## Virtual Reality (VR) and 3D Simulations

VR and 3D simulations are transforming how learners gain practical skills. These tools have been used by other professionals, such as surgeons or pilots, to create a safe way for new learners to try out new techniques and build up their experience. Now, these same tools are available for learning the construction trades. That means learners can first engage with 3D interactive simulations to work with dangerous equipment, giving them confidence to handle real-world situations. VR takes that experience to another level by immersing participants in a multi-sensory learning experience.





## Two Models for Implementation: *Hybrid and Self-Service*

While the possibilities for how a flexible program could look are endless, we've found two models that are easy to implement and set programs up for success.

### Embrace the Hybrid Model with a Flipped Classroom

Rather than spending valuable class time introducing new concepts, programs can maximize their synchronous learning time by supplementing it with flexible learning.

For instance, a job-seeker pursuing an electrical training program could complete electrical wiring simulations as pre-work, building foundational knowledge. In the lab, that same learner can apply what they learned under instructor supervision. After class, participants can take assessments to reinforce their learning and test their skills.

The flipped-classroom approach prioritizes real-time feedback from instructors and peers, makes training more engaging, and increases learners' confidence.

### Explore a Self-Service Model for Learners Who Need Flexibility

Another approach to flexible learning programs is a completely self-serve program where learners engage with content on their own.

For example, a participant might start their day by watching training videos before heading to work, engage in a simulation exercise during their lunch break, or complete an assessment in the evening.

This model is particularly beneficial for job-seekers who are balancing work, family, and education. Whoever is managing the program will want to look for a tool that allows them to track learner progress. That will allow your program to know who is moving through the work well and when learners will need to start preparing for the next steps of a job search.

## THE FLIPPED CLASSROOM

### IN CLASS

Learners practice  
applying key concepts  
with feedback

### DURING CLASS

### BEFORE CLASS

Learners prepare to  
participate in group  
training

### AFTER CLASS

Learners check their  
understanding and  
extend their learning

### OUT OF CLASS



## Pillar 1 in Action: A Flexible Training Program at JASA Inc. Trade School

Virginia-based JASA Inc. Trade School [offers industry-recognized training](#) and job-readiness programming in electrical, plumbing, HVAC, and construction. The school wanted to expand its program to serve a wider range of learners while maintaining their emphasis on hands-on learning but faced challenges due to geography and limited resources.

### Solution

JASA introduced virtual learning with the Interplay Learning platform. They moved 90% of their learning online, but continued with some in-person labs at smaller workspaces. The curriculum combines interactive, at-home training kits, Interplay Learning's videos, and 3D and VR simulations. This allows learners to engage with virtual hands-on learning on their own time wherever they are, and helps them prepare to take full advantage of the in-person lab time where they work on live equipment.

By leveraging 24/7 remote access to training, busy and resource-constrained learners can safely gain practical skills and confidence at their own pace in a simulated environment before transitioning to hands-on lab sessions. This means that they can serve more learners, and those learners are better equipped to stay on track with their goals, because they have the flexibility to make it work with their schedules.

### Outcomes

- Doubled program enrollment
- More than doubled their revenue
- Reduced operational costs by \$25,000 per month due to reduced physical resources
- Increased job placement rate by 10-15% to reach 85%
- Part-time learners average 90 days to program completion



*"You have a busy schedule. Let's say you are working and you can go on Interplay at your own time whether you are traveling a lot or going to work. You do it at your own time, at your own pace, and I love that."*

**JJ Bowie,**  
*Student at JASA Inc. Trade School*



## Pillar 2: Credentialing and Certification

Program completion is valuable in the skilled trades, but an employer still needs to see that you can apply that knowledge in the field. That leads to the second pillar of job-readiness programs: credentialing and certification.

[Certificates and credentials](#) such as NATE Ready to Work, OSHA 10-Hour Construction, EPA 608, and HVAC Excellence validate a candidate's skill set and show that they can meet employer and industry requirements. Many trades jobs require certain credentials, and a job-seeker who already has them can start work faster without having to study and take assessments on the job.

## Benefits of Credentialing and Certification

- Meets employer requirements and enhances job readiness.
- Builds credibility and trust with employers and job-seekers.
- Gives job-seekers a competitive edge when applying for jobs.

## Certifications to Include In Your Career-Readiness Programs:

### OSHA 10-Hour Construction

OSHA (Occupational Safety and Health Administration) is the U.S. body governing safety in the workplace. Getting your OSHA credential is key in preparing for a new career in the trades.

### EPA 608

To handle any type of refrigerant, you need an EPA 608 certification to show you know how to work with refrigerants while keeping people and the environment safe from hazardous chemicals.

### NATE Ready-to-Work

The NATE Ready-to-Work certification is awarded upon passing a knowledge-based exam. It is perfect for entry-level technicians with zero to six months of experience who are entering the field.

### HVAC Excellence

Issued by ESCO Group, HVAC Excellence's Employment Ready Certifications are a great fit for job-seekers who are looking to enter the workforce as entry-level HVAC Technicians.





## Two Models for Implementation: *Do-It-Yourself (DIY) or Pre-Built Curriculum*

When offering credentials through a workforce development program, there are two options for implementation. The first is more customized to your area and resource-intensive, while the second allows for a faster on-ramp to launch.

### DIY

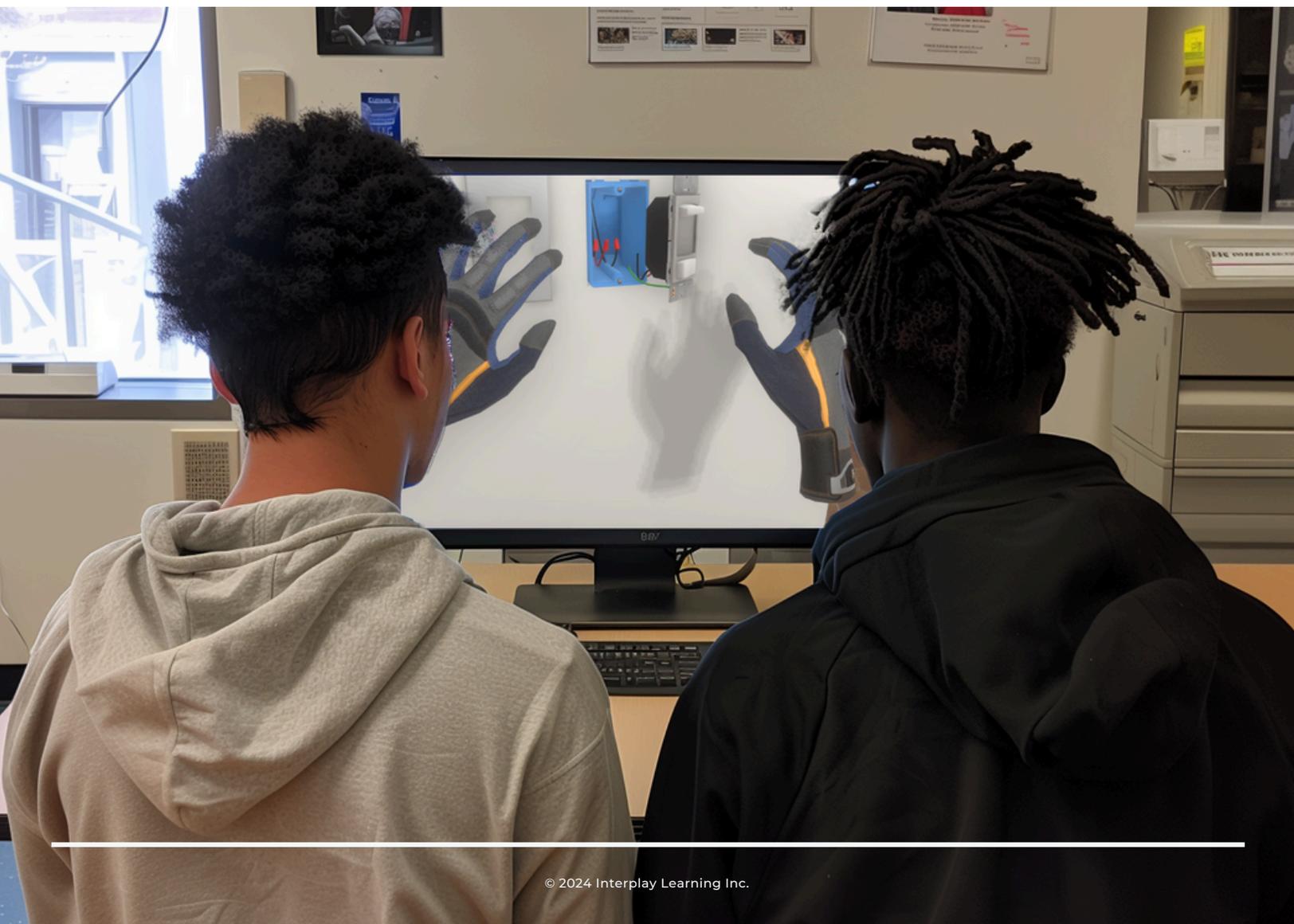
One way to approach credentials is to research the industries and regulations in your area to find the highest-priority credentials. Then, build the certification prep courses, study guides, or practice assessments yourself.

For instance, you could build a prep course from scratch for learners and have them complete it before sitting for an exam. While this approach lets you customize a program and target particular needs in your community, it takes much more resources and time to build.

### Pre-Built Curriculum

Alternatively, organizations can adopt pre-built prep courses designed to align with industry standards. These programs, from providers like [Interplay Learning](#), often include coursework, knowledge checks, and other resources specifically aimed at helping participants pass their certification and credentialing exams.

This out-of-the-box approach gives you a faster on-ramp to launch, while removing the headache of researching, building, and maintaining a certificate course to industry standards.





## Pillar 2 in Action: Certifications and Credentialing at Centro Educativo Latino

Centro Educativo Latino (CEL) at Lenoir Community College works to bring high-quality technical education for their local Spanish-speaking population. CEL aimed to expand access to trades education through Spanish-language courses and innovative training methods.

### Solution

CEL launched the nation's first NATE HVAC hybrid certification program in Spanish. Their model combined Interplay Learning's online courses, 3D simulations, and VR training with in-person instruction. CEL employs a sliding-scale pricing model, making education financially accessible. They also offer flexible learning formats for learners spread across 29 counties. Their popular weekend classes accommodate enrollees who work full-time or have familial responsibilities.

### Outcomes

- 99% program completion rate.
- 100% attainment of NATE Core certification and state EPA 608 certification among graduates.
- 100% job placement rate in the trades workforce, with 75-80% becoming entrepreneurs.



*"When students show up to local employers with three community college certificates, NATE Ready-to-Work, the State EPA certification, and a portfolio of about 34 Interplay HVAC certificates, the employer says to us, 'We need more of these people.' So we stay well-connected and funnel our students into the workforce when they meet employers' qualifications."*

**Carlos Cotto,**  
Director of Centro Educativo Latino





## Pillar 3: Safety

While safety and regulatory adherence are high priorities on a job site with more experienced technicians, it's always a challenge to ensure new learners can practice in a safe environment. Learners may interact with hazardous chemicals, heavy equipment, and live electricity to learn a trade. In fact, it is only through experience that a learner can become an expert, so workforce development programs must constantly balance creating a safe environment while still offering effective learning experiences.

The top challenges and barriers to a safe program include:

- **Overenrollment:** 57% of trades educators have over the recommended 24 learners in a classroom, while just 26% had sufficient space for large classes.<sup>4</sup> Course enrollments over 24 increase the odds of an accident by 48%.<sup>5</sup>
- **Lack of safety training:** Only 32% of instructors received safety training when initially hired, and only 56% of instructors received safety training updates within the past 5 years. Comprehensive safety training (for both instructors and learners) reduces the odds of an accident by 49%.<sup>5</sup>

Authentic, experiential learning is critical for becoming career-ready in the skilled trades. In-person learning isn't going away, but it can be made safer by supplementing it with safety training and VR and 3D simulations first.

You've already seen how virtual, immersive learning can benefit learners through a multi-sensory learning approach. The other advantage of this technology is increased safety.



**80% of trades instructors experience one or more minor safety-related accidents per year<sup>4</sup>**



**12% of trades instructors experience one or more major accidents per year**



## How to Reduce Risk with Virtual Safety Training

Virtual safety training prepares participants for real-world conditions and complements hybrid and in-person training. Taking advantage of modern technology allows learners to gain experience and exposure before ever touching live equipment.

Let's take a look at two instructional methods that allow programs to improve safety and decrease risk while still preparing students for success in the field.

### Video Training

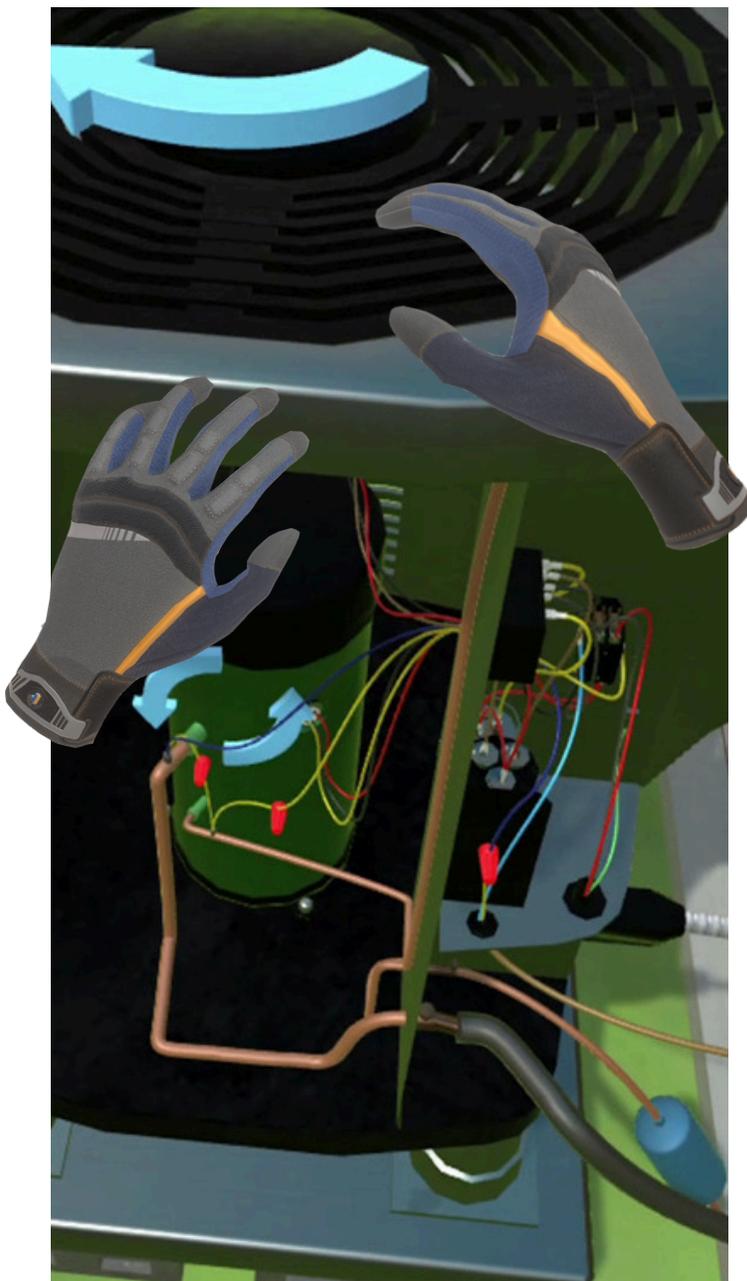
Video instruction allows learners to observe safety protocols in action before they ever touch live equipment. A visual demonstration of the protocol helps to engage learners and boost recall, while knowledge checks give instructors confidence in learners' understanding of the material. Avoid "talking head" videos, and instead take advantage of videos that are more visual in showing equipment and processes with expert-led voiceover. This more effectively shows learners how the equipment works and what safety measures they need to take before they start working on live equipment.

### Immersive Simulation Training

By using VR or online simulation technologies, learners can practice operating equipment in a virtual environment that mimics real-world conditions. Surgeons and airplane pilots have used this method for years to practice and learn in an environment that doesn't put their lives or others at risk. Virtual training allows new learners to build confidence and competence without the risks associated with live training. It also means you can put students in a range of troubleshooting scenarios where they can practice, even if the scenario would be in a less safe location (such as on scaffolding) or require interacting with unsafe equipment (such as fire or electricity).

## Benefits of Virtual Immersive Training for Safety

- Reduces stress and concern for both learners and program managers around safety.
- Increases learner preparation and confidence before completing hands-on activities.
- Offers the potential to reduce costs on consumable materials, injury claims, and insurance costs. JASA Inc. decreased insurance premiums by 60% with Interplay Learning's industry-approved safety training.





## Pillar 3 in Action:

# International Union of Operating Engineers Local 94 Union Increases Safety During Training

Local Union 94 supports member operating engineers in New York City. As the industry evolved, the organization needed to [modernize its training programs](#) to better prepare members for the critical role of stationary engineers in commercial buildings. The union wanted to equip its members with safety training for the NYC Refrigeration License (Q-01/Q-99) and EPA 608 Universal Certification exams, both essential for becoming licensed stationary engineers. One of their biggest challenges was ensuring safety during training and getting around the lack of access to refrigeration equipment to practice and learn.

## Solution

Local Union 94 integrated Interplay Learning into its 20-week, 200-hour training program. Interplay Learning provided members with interactive simulations, engaging videos, and mobile-friendly learning materials. The curriculum allowed members to gain practical experience in a safe, virtual environment where they could access a wide variety of equipment types and scenarios. Interplay Learning's programs appealed to younger union members who preferred visual learning methods, significantly enriching their understanding and retention.

## Outcomes

- Deeper understanding of the material and a significantly higher pass rate for the licensing exams.
- Increased safety by using interactive simulations to practice real-world scenarios they may encounter on the job.
- Improvements in work-life balance thanks to the flexible learning model.
- Participants gained opportunities for advancement and higher earning potential due to the training.



*"Interplay's interactive simulations help simulate real-world scenarios, allowing members to safely practice essential tasks and procedures they may encounter on the job. This hands-on experience builds confidence and competence, leading to higher success rates on the exam."*

**Dave Hawkins,**  
Training Director, IUOE Local Union 94



## Pillar 4: Employer and Community Partnerships

The final pillar is building strong partnerships with local employers and other workforce organizations. These relationships are essential for aligning training programs with industry needs, facilitating job placements, and enhancing program impact.

By building strong partnerships, you can be sure to stay in the loop on industry demands and changes. For example, over the last decade we've seen massive shifts in the workforce with things such as the growth of AI or the decline of industries such as coal or oil. By staying close to your industry partners, you can be aware of these upcoming changes earlier and be in a position to start helping folks upskill or re-skill as needed.

For the construction trades in particular, these partnerships can also make it easier to facilitate things like apprenticeships which can lead into long-term career building opportunities. On-the-job training is necessary to make the transition from a learner to a technician-in-training. The more partnerships you have in place, the easier it will be to make those connections and placements for your learners.

### Benefits of Employer and Community Partnerships

- Enhanced talent pipelines with facilitated job placements for graduates.
- Diversification of the workforce through increased training access for underserved populations.
- Allow organizations to pool resources for greater scalability and impact.
- Contribute to the local economy and community development by aligning stakeholder priorities and reducing barriers to growth.

Organizations can build these partnerships in several ways. Ideally you would pursue multiple paths to partnerships, but if you are starting out fresh, pick one or two of the options here and start building there. It can also be easier to pick one of your career-readiness programs and start building relationships there.

For example, if you have a plumbing training program, use one or two of the below items to start building more relationships with plumbing companies. Then use the same strategies for your HVAC program, and you can create sustainable growth that way.

### Ways to Grow Your Partnerships

- **Employer Outreach and Engagement:** Connect with local employers to build relationships and learn their needs and realities. Actively engage them by providing platforms for their voices to shape workforce strategies. This could include participating in surveys or industry-focused councils. Employers are often eager to engage with training programs that produce well-prepared candidates, and these relationships mean you are already a step ahead when it comes to post-training job placement.
- **Collaborative Training Programs:** Employers can play a crucial role in providing apprenticeships, pre-apprenticeships, and on-the-job-training in partnership with workforce development organizations. This approach not only ensures that the training is relevant and effective, but helps employers meet their hiring needs.
- **Industry Events:** Hosting or attending industry events and networking with employers or other workforce professionals can open doors to new collaborations and partnerships.
- **Partner With Nonprofits and Other Workforce Organizations:** Partnering with community-based organizations, educational institutions, and local government agencies can help to create a support network for trainees. This network can provide wrap-around services, ensuring that the most vulnerable populations receive the necessary support to succeed. Another example is [BlueRecruit](#), a job platform that bridges the gap between recent graduates and employers.
- **Work With Educational Partners:** Many universities, trade schools, or other educational organizations already have training programs in place. By collaborating with an established school or online provider like [Interplay Learning](#), you can streamline your launch and bypass the effort of building the curriculum yourself.



## Pillar 4 in Action: The DBake Foundation Leverages Employer and Community Partnerships

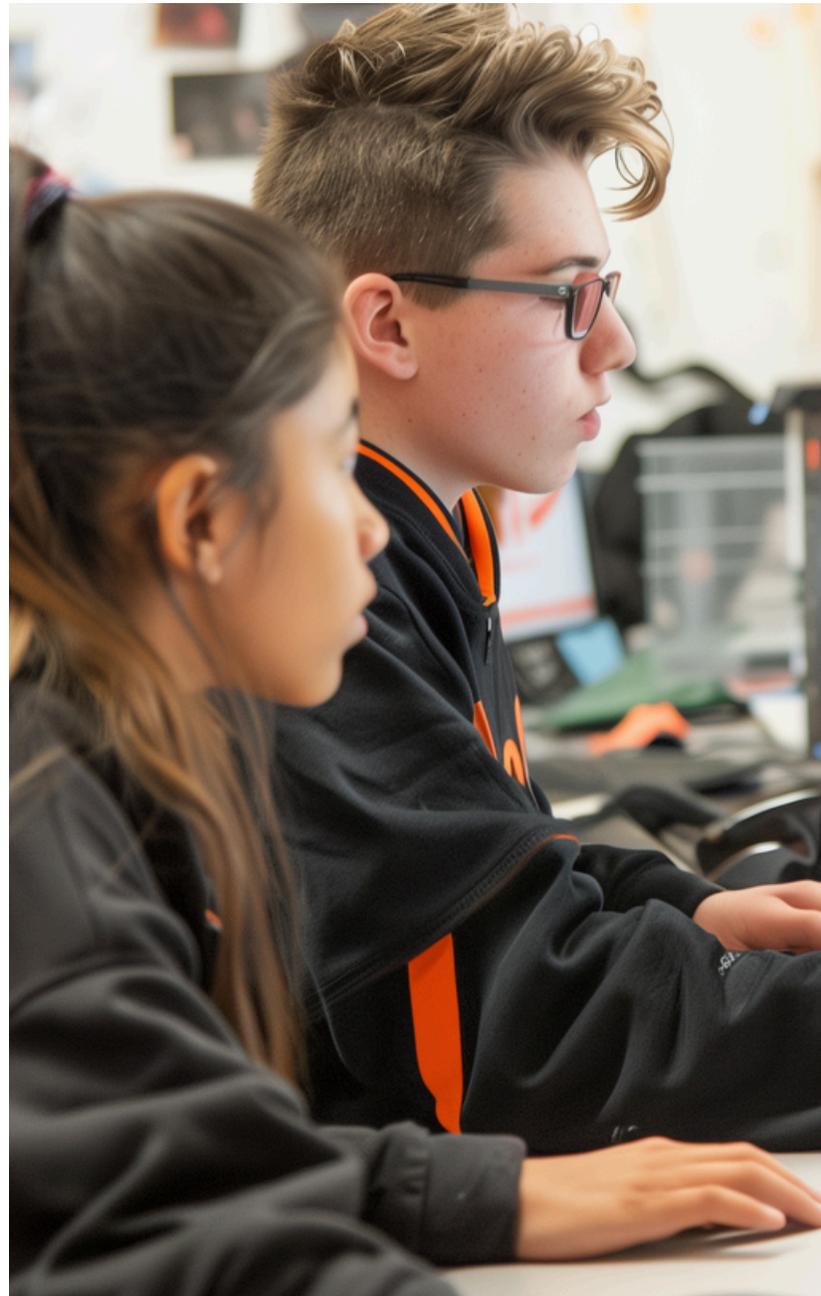
DBake Foundation is a nonprofit organization founded to honor the legacy of Damion Baker, who died as a result of violence in St. Louis in 2022. Baker had envisioned a nonprofit that would equip underserved communities with essential job skills in the construction trades and address the lack of diversity in the construction industry.

### Solution

Baker's mother, Annamarie, partnered with Employ St. Louis to create a pre-apprenticeship program that combines traditional construction training with modern technology. [The program incorporates Interplay Learning](#), an innovative platform that uses immersive 3D simulations, virtual reality (VR), and high-impact video content to teach hands-on trades skills. The program also offers pathways to earn an Interplay Learning Job-Ready Certificate and industry-recognized certifications such as OSHA 10-Hour Construction in partnership with Career Safe and EPA 608. Thanks to the Employ St. Louis partnership, learners receive meaningful wraparound support.

### Outcomes

- Offered free pre-apprenticeships to 15 people in fall 2024
- Appealed to young adults with gamified learning
- Continued preservation of Baker's legacy for the next generation





## Accelerate Job-Readiness in Your Community

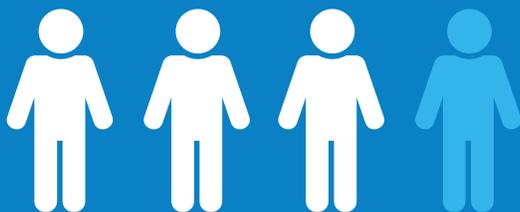
The skilled trades are a critical component of our economy, and the need for a well-trained workforce has never been greater. As we plan for the future, it's clear that career-readiness programs in the construction trades must evolve to meet the needs of the next generation.

By implementing these four pillars—Flexible Training Programs, Credentialing and Certification, Safety, and Partnerships—organizations can create programs that meet current industry demands and prepare workers for the challenges of the future.

## Gen Z and the Skilled Trades

Gen Z learns differently from Baby Boomers, Gen X, and even Millennials. As digital natives, Gen Z students expect access to hybrid or virtual learning environments.<sup>6</sup> Members of this generation are the biggest consumer of video content,<sup>7</sup> streaming approximately two hours of video content daily.<sup>8</sup> Entrepreneurial and wary of the debt accompanying four-year degrees, this generation is prime for skilling in the trades. To attract and retain these future workers, programs must offer the flexibility and immersive programs that students want.

**3 out of 4 Gen Zers are interested in vocational training that offers paid, on-the-job training<sup>9</sup>**



## Key Takeaways

- Growth in the trades and an aging of the workforce leave a significant skills shortage in areas like HVAC, electrical, plumbing, solar, and construction. Workforce development programs can lead the way to bridge this talent gap and provide pathways to in-demand careers for job-seekers.
- While hands-on training remains important, you can reduce safety risks and costs through virtual and immersive training methods, such as VR and 3D simulations.
- Industry certifications and credentials give job-seekers a competitive edge and help to meet employer requirements.
- Safety should be a top priority for training programs. Virtual safety training and immersive simulations can reduce risk and costs.
- You don't have to build a program from scratch. Learn from case studies and organizations who have been through the process, build partnerships, and leverage out-of-the-box curriculum solutions.





## Interplay Learning: Accelerate Career Readiness

Re-skilling the next generation doesn't have to take years. You can implement or grow your workforce development program quickly and affordably with Interplay.

Train anywhere, anytime with on-demand skilled trades training and 3D simulations to quickly prepare your learners with job-ready skills and certifications for trades careers today.

- Courses, video training, and knowledge checks that align with industry standards.
- Prep courses and assessments for high-value trades certifications and credentials, including OSHA, NATE Ready-to-Work, and EPA 608.
- Unlimited 3D “field-like” simulations for learners to safely practice troubleshooting from anywhere.
- A unified platform to create individualized pathways and track learner progress all in one place.



## Start Your Journey with Interplay

Ready to start building your program today? Contact our team to get started.

Contact: [sales@interplaylearning.com](mailto:sales@interplaylearning.com)



## Appendix

1.) 2022 Workforce Survey Results,  
*AGC Construction & Autodesk*

2.) North America Construction Market Size (2024-2029)  
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3.) Payroll employment rises by 254,000 in September; unemployment rate changes little at 4.1%  
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5.) Factors and training associated with STEM education and CTE laboratory accidents in the United States  
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6.) How the next generation will shape the next normal  
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7.) How Gen Z consumes media in 5 charts  
*EMARKETER*

8.) Gen Z viewers watch 3 times as much streaming content as live television  
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9.) Jobber's Blue-Collar Report. Gen Z and the Uncertain Future of the Trades  
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