



YOUR CONSTRUCTION SAFETY PROGRAM:

SAFE STUDENTS, SAFE WORKERS

A Guide for Administrators & Instructors in
Post-Secondary Career Technical Education (CTE)
Construction Programs



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Executive Summary

CTE administrators and instructors in construction programs are critical to establishing Safety and Health Management Systems that will protect and prepare new and young construction workers.

1. School & Program

2. Instructor Qualifications and Support

3. Effective Teaching and Learning

4. Offsite Learning: Safety and Health Program Practices

CONSTRUCTION IS BOOMING, AND INDUSTRY DEMAND FOR NEW, skilled workers is growing. Each year, 2-year post-secondary Career Technical Education (CTE) programs train roughly 78,000 students to enter this dynamic field. Yet construction work is also dangerous, with two to three construction workers dying every day on the job in the United States. Young workers and workers new to the job are at even greater risk for injury. In 2015, more than 8,300 workers between the ages of 16-24 were seriously hurt on the job.

Workers in construction need to be prepared to work safely in changing, hazard-filled environments, armed with the knowledge and skills to protect themselves and their co-workers. Safety skills are critical employability skills, and well-trained workers help save their employers the high human and financial costs of injuries. One of the few places new construction workers gain these critical employment skills are in construction programs at community colleges and technical schools. Providing effective safety and health education to students in these programs is essential to ensuring future workers return safe and healthy to their families.

Safety Happens in Systems. Injuries in construction do not just happen because someone is careless one day. Whether it is out in the field or in the community college classroom, safety depends on systems that are established by leadership at schools and by contractors out on the jobsite.

Purpose of this Guide. This guide focuses on key program elements of these systems for safety. It describes each element and shares new research data from a recent study on the current state of safety and health education in these programs. It then provides action steps CTE administrators and instructors can take to strengthen their programs. Be sure to check out the online [Self-Assessment Tool](#) to see how your program stacks up and to identify areas to focus on in the guide.

FROM OUR RESEARCH

The Good News:

- *The majority of instructors had positive impressions of the Safety and Health Management Systems at their schools.*
- *All instructors come in with field experience, and most reported at least some training in a variety of teaching skills, with support for professional development available.*
- *Instructors prioritize hands-on skills training and regularly update their curriculum.*

The Challenge:

- *A significant number of schools are lacking in important components of an effective Safety and Health Management System, including regular inspections to identify hazards, involving key players in investigations of hazards or injuries, and a clear commitment to the “hierarchy of controls” in addressing hazards.*
- *Only half of all programs require either OSHA 10-hour Construction Training (OSHA 10) or the OSHA 30.*
- *A significant number of instructors lack training and support for developing effective safety and health instruction, especially in integrating the OSHA 10-hour content.*
- *In the classroom, there is a gap in providing students with critical thinking skills in safety and health, such as job hazard analysis, understanding the “hierarchy of controls,” and self-advocacy skills.*
- *Industry Advisory Committees (IACs) are being leveraged well in only about half of programs—a critical missed opportunity to strengthen SHMS in the program and classroom.*

Administrators



- **Make sure your CTE program has an effective written SHMS policy.** Establish a regular internal inspection schedule in the programs you oversee and ensure follow-up on any identified hazards. Regularly communicate the SHMS policy, and your program's management commitment to safety and health, to staff and students. Participate in periodic health and safety inspections in the classroom.
- **Prioritize engineering controls or “upstream” solutions when possible.**
- **Develop systems to support instructors as safety and health educators.** Require safety and health goals in instructor professional development plans and evaluations. Make sure all instructors have taken the OSHA 30 for construction, even if your regional accrediting body does not require it. Establish a mentoring program for new instructors. Provide time, resources, and concrete expectations for instructors regarding IAC recruitment and engagement.

Instructors



- **Work with your administration to establish a workable internal inspection process and schedule.** Include students on your inspection teams. Follow-up on any classroom hazards that are identified.
- **In the classroom:** Integrate the OSHA 10 throughout coursework. Focus on safety and health critical thinking skills, such as Job Hazard Analysis and the hierarchy of controls. Have students practice self-advocacy and communication skills. Have students participate in the classroom SHMS.
- **Establish systems for recruiting and engaging IAC members.** Clarify expectations, invite them to participate in specific ways that support your safety and health training, and hold them accountable.

Introduction

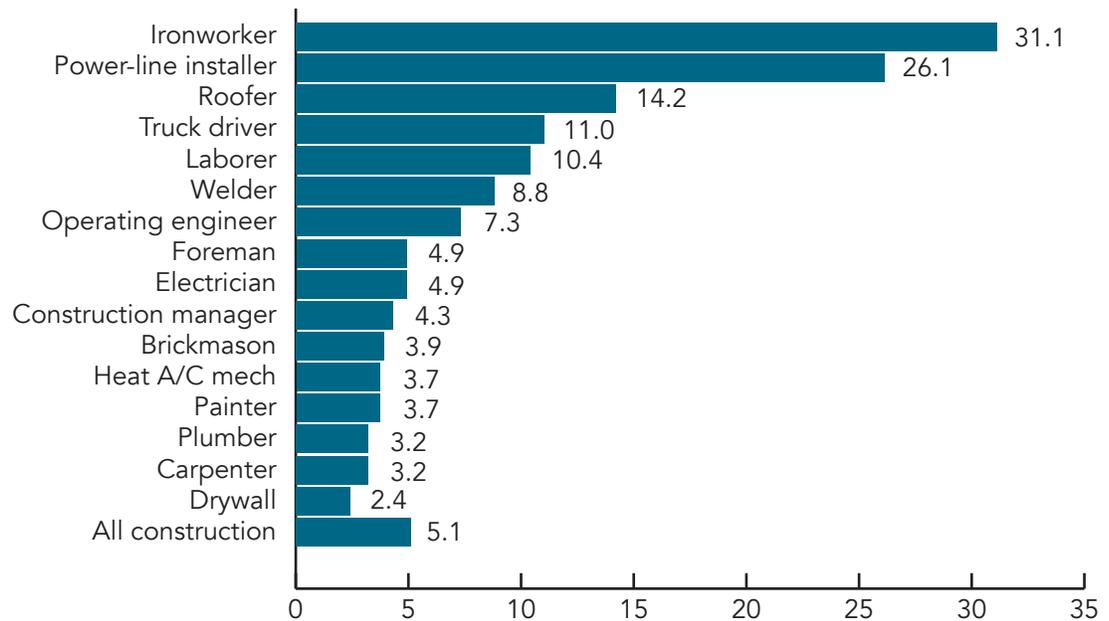
EACH YEAR, CAREER TECHNICAL EDUCATION (CTE) programs in 2-year community colleges or technical schools train roughly 78,000 students who are interested in a career in construction, one of the country's most vibrant yet most dangerous industries. Two to three construction workers die every day on the job. Young workers and workers new to the job are at greater risk. In 2015, at least 8,350 young construction workers (age 16-24) were injured on the job, losing at least a day away from work. Providing effective safety and health preparation to students in CTE construction programs is critical to protecting future workers and ensuring they return safe and healthy to their families. This training provides students with essential employability skills, and keeps them safe while still at school.

This guide outlines key components of systems for safety and health in post-secondary CTE construction programs and provides action steps that CTE administrators and instructors can take to make improvements. The document is based on research completed in 2017.

2-3
construction workers die on the job every day.

Effective systems for safety & health education in CTE construction programs can help prevent this.

Lifetime risk of fatal injuries, per 1,000 full-time equivalent workers



Source: CPWR's Construction Chart Book, 2013

Safety Happens in Systems

Injuries in construction do not just happen because someone is careless one day. Whether it is at a construction company or a community college, safety depends on systems that are established by leadership at schools and by contractors out on the jobsite. Safety must be a comprehensive, systemic component of the organization's operations, and everyone has a role to play.

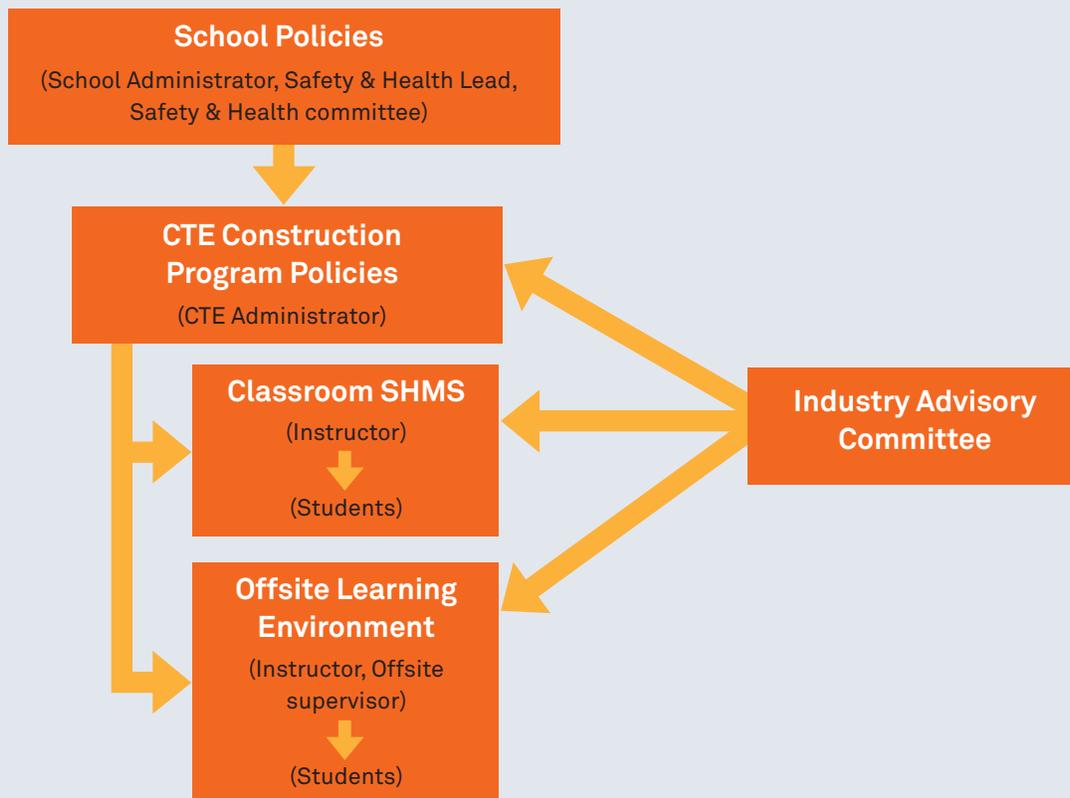
Safety and Health Roles

CTE administrators (department chairs and deans) are responsible for the implementation of the school's "Safety and Health Management System" (SHMS—also called a Safety and Health Program or Plan) within the departments they oversee, for school employees as well as students. This implementation includes creating a strong safety culture and encouraging active participation within the departments. It also includes ensuring that well-qualified instructors are properly trained, evaluated, and supported in updating and developing their safety and health knowledge and teaching skills. The SHMS of a CTE construction

program forms the backdrop for students' foundational understanding and practice of safety at school and on the job, and sets the stage for everyone to work, teach, and study safely.

Instructors' primary role is to effectively bring the program's SHMS into the classroom and learning environment by ensuring that equipment, facilities, and worksite experiences are free from recognized hazards and comply with the highest standards; by promoting a strong safety culture in the classroom; and by facilitating teaching and learning that results in student attainment of safety and health competencies. Key student competencies include specific safe work practices, a broad understanding of how hazards in the workplace can and should be controlled, and the communication and problem-solving skills to address issues that arise on the jobsite. In addition, instructors play an active role in overseeing SHMS practices in any offsite learning environments, as well as in actively participating in the school's SHMS as employees.

Who Plays What Role in the Safety System



The risk of being
fatally injured
on the job for
construction
workers is

5.1

out of

1000

full-time equivalent
workers — with
some trades more
at risk than others.

OSHA considers

1

death in

1000

workers to be a
significant risk.

Industry Advisory Committees (IACs) ensure that each program's course of study is relevant to industry needs. IACs provide advice on course content, real-world examples of on-the-job safety and health issues and employer expectations, opportunities for instructors to keep current through job shadows and externships, and regular evaluation of the program. IAC employers also provide valuable work-based learning opportunities for students.

Students are expected to learn and practice the skills they will need in the workplace. Students develop safety and health skills best when they learn in an environment that reflects high industry safety and health standards.

When high standards are in place, students learn and practice safe work processes. They receive required training on equipment they will use, and work processes they will perform. The environment encourages their involvement—to ask question or speak up when they have any safety or health questions or concerns. Students experience the “why” behind safety rules, and develop a foundational understanding of safety systems.

The Good News:

Instructors are well aware of the need for safety and health training in their programs. They are committed to hands-on skills training, and generally feel supported by their administrators and Industry Advisory Committees in keeping their equipment, facilities, and programs up-to-date in safety protections and education. CTE administrators and instructors care about their students, and want them to be protected in their programs and have the skills to work safely on the jobsite. Many schools have critical program components in place at the administrative level that support safety and health, through facility maintenance and improvements, by supporting instructors in their professional development, and by providing resources to ensure effective education in the classroom.

The Challenge:

Systems for safety and health in CTE construction programs at community colleges and technical schools are not as strong as they need to be. Critical gaps for many schools include:

- **A significant number of schools lack important components of an effective Safety and Health Management System**, including a system of regular inspections to identify hazards, systems that involve key players in investigations of hazards and injury or near miss incidents, and a clear commitment to the “hierarchy of controls” that recognizes the importance of engineering hazards out of the work when possible rather than relying on personal protective equipment.
- **A significant number of instructors lack support for developing their teaching skills, as well as training and resources to ensure effective integration of safety and health education**, especially of the OSHA 10-hour training, basic safety training that is increasingly required on construction jobsites.
- **In the classroom, there is a gap in providing students with skill development in job hazard analysis**—including training on and utilizing the “hierarchy of controls,” which focuses on engineering solutions and more effective “upstream” ways to protect workers—as well as in self-advocacy and problem-solving skills students will need on the job.
- **In many schools, Industry Advisory Committees (IACs) are not effectively engaged**—a critical missed opportunity to strengthen SHMS in the program and classroom.

While the study results reflect what’s happening at the post-secondary level, much of the information in this guide also will apply to CTE construction programs at the secondary or high school level.

About this Guide

This guide is for administrators and instructors in CTE construction programs to identify gaps and learn about recommended practices to strengthen student preparation in safety and health. It is not intended to be comprehensive – there are other resources that are (see page 13). Instead, we have focused on critical components where, based on our data, CTE construction programs appear to have gaps.

The information in this document is drawn from a first-of-its-kind research study on safety and health education in post-secondary CTE construction programs and established best safety practices in construction. The research involved first identifying the key elements that every CTE construction program should have to create a safe environment in which to work and learn and to instill safety knowledge and values into every student. This was done through interviews and meetings with over 65 CTE construction program subject matter experts, including instructors and administrators. To see how programs across the country were doing relative to these key program elements, we surveyed 270 instructors, deans, and program chairs from CTE construction programs at 63 public community colleges or technical schools in 34 states across the country. It is important to point out that the data presented in this document are from those willing to participate in our survey, therefore it is possible that our results on how CTE construction programs are doing reflect the realities of those programs with a more robust focus on safety and health. More information about the study can be found at the end of this report.

How to Use This Guide

This guide is organized in four sections:

1. School and Program: Safety and Health Management Systems
2. Instructor Qualifications and Support
3. Effective Teaching and Learning
4. Offsite Learning: Safety and Health Program Practices

In each section there are several key program elements identified through our research. For each program element there is:

- A description of the element based on our research and recommended practices
- Our data on how CTE construction programs are doing
- Action steps and recommendations for improvement
- Links to resources that will help CTE administrators and instructors implement these steps

Start by reviewing all of the key program elements in each section, or first complete the “self-assessment tool” available online at <http://bit.ly/cte-guide/> to identify where your program is stronger and where it needs more attention.

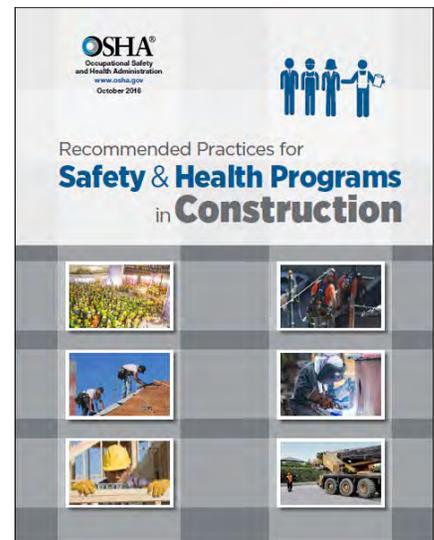
We also recommend using this guide in conjunction with these two resources:

- [OSHA’s Recommended Practices for Safety & Health Programs in Construction](#). The OSHA guide comprehensively describes core elements essential to an effective Safety & Health Program, and provides the framework for the recommendations in this guide. CTE construction programs that reflect these core program elements will keep their students safe at school and expose them to the highest industry standard in safety and health protections.
- [NIOSH Safety Checklist Program for Schools](#). The NIOSH Safety Checklist Program contains four chapters and several appendices: 1) how to read and interpret safety regulations; 2) developing, implementing, and maintaining a safety program, 3) customizing and using checklists with students to teach hazard recognition and abatement; and 4) safety checklist, and other resources.

These resources will help you develop a comprehensive Construction Safety & Health Management System, and bring this system effectively into the classroom.

A Note About Resources

In the Action Steps and in the [Resources](#) section, we have shared links to sample resources where possible, provided by our project Advisory Group, survey responses, and site visits.





School & Program



THE SAFETY AND HEALTH OF YOUR STUDENTS, FACULTY, and staff start with your school and program's Safety and Health Management System (SHMS). Integrating recommended safety and health practices into your CTE construction programs exposes students to the highest industry standards in their learning environment. Your SHMS serves as the foundation for students' understanding that safe work environments and practices originate in comprehensive systems while also protecting students, faculty, and staff at your school.

This section focuses on several key elements of Safety and Health Management Systems (SHMS) at the administrative (school and program) level. See Sections 3 and 4 on classroom learning and field work regarding how SHMS core elements should be reflected in the classroom and offsite learning.

- Management leadership
- Regular inspections to identify hazards
- An active reporting system to identify hazards
- Investigating all injuries, incidents and near misses to identify underlying hazards
- Controlling hazards effectively to prevent injuries

According to OSHA, there are seven core elements of an effective SHMS in the construction industry:

- Management Leadership
- Worker Participation
- Hazard Identification and Assessment
- Hazard Prevention and Control
- Education and Training
- Program Evaluation and Improvement
- Communication and Coordination for Employers on Multiemployer Worksites

(SHMS programs are required in 15 states. For a comprehensive description of these elements in the construction industry, visit [OSHA's Recommended Practices for Safety & Health Programs in Construction.](#))

Management Leadership

“It helps to have a periodic walkthrough by upper management to show students that the instructors are not the only members of the organization concerned with safety.”

–Instructor

Financial and staff resources are often necessary to address safety and health hazards that have been identified. While some hazards will be relatively easy fixes, others may require more significant outlays, such as new equipment, systems, or staff training. See Box on page 34 for examples of how programs have covered safety & health needs.

THE TONE AND EXAMPLE OF LEADERSHIP AT THE TOP SETS the stage for safe practices throughout the program and among its faculty, staff, and students.

What This Looks Like

- School administrators and program deans demonstrate consistent commitment to eliminating hazards and to continuously improving workplace safety and health systems.
 - Administrators ensure there is a clear, strong written safety and health policy in place (the SHMS).
 - Each administrator has a personal professional development plan that includes development of safety and health knowledge.
- School administrators and program deans regularly communicate their commitment to safety and health to staff and students and set program expectations and responsibilities.
 - They make sure that all school employees know where to find the written policy, who is in charge, and where to report hazards.
 - Faculty and staff are involved in implementing the plan’s components.
- CTE administrators engage Industry Advisory Committee (IAC) members to support safety and health as a core CTE construction program value. IACs help establish safety and health goals and objectives, provide adequate resources and support for the program, and set a good example in providing safe work-based learning opportunities, education, and training for students. (See Section 2D for more information on IACs.)

How CTE Construction Programs are doing

The majority of instructors had positive impressions of the Safety and Health Programs at their schools.

79% of instructors were satisfied with their program's overall management of student safety and health, and 74% felt that program administrators were committed to safety and health and that resources were readily available.

In some schools, however, instructors and some administrators did not know about basic elements of their school's safety and health infrastructure, or reported they were lacking.

Approximately one in ten administrators and one in four instructors did not know whether their school had a written safety and health plan. Of those administrators who were aware that their school had a safety and health committee, only about half assessed the committee to be effective in supporting safety and health improvements.

68% of program administrators say their school has a standing Health and Safety Committee.

Of those with Health and Safety Committees, only **56%** of administrators assess them as effective in supporting safety and health improvements.

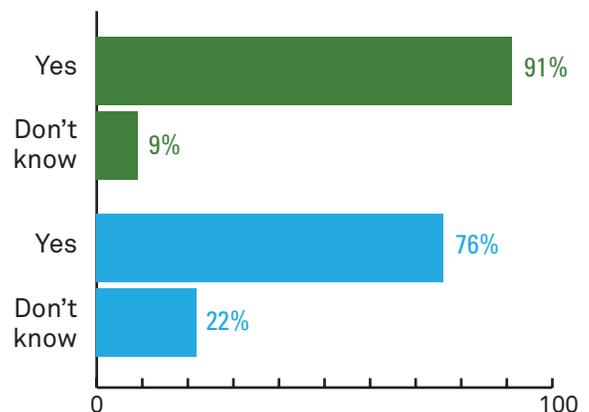
Does Your School have a Written Safety & Health Plan?



Administrators report



Instructors report



66% of all instructors knew who at their school oversees employee safety.

21% did not know if their school had such a person.

Administrators



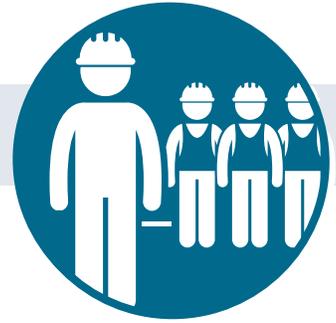
- Establish an effective written policy.
 - Use [OSHA's recommended practices for Safety & Health Programs in Construction](#), and this [etool for an Injury and Illness Prevention Program](#) to help you get started, or to review the plan you have.
 - See if [your state requires a written safety and health program](#). Then check with [your state OSHA program](#) for specific requirements related to your state.
 - Make sure faculty from your department or program are involved in the committee to review or write the policy.
- Communicate the policy to all school employees.
 - Ensure that the policy is reviewed during new employee orientation.
 - Every year at convocation, remind faculty, staff and students about the safety policy, including how to report hazards.
- Identify and allocate resources to control hazards.
 - Review program budgets and staff workloads with safety and health needs in mind, including what will be needed to control hazards and improve safety and health capacities among faculty and staff.
 - Review the school's strategic plan. It should include a statement on safety and health and ensure funds necessary to address issues.
- Ensure that administrators have the necessary safety and health training.
 - Include safety and health training in administrator professional development plans.

Administrators, cont.



- Training should include:
 - Their responsibilities in the school or program's safety and health policy.
 - Fundamental concepts for recognizing and controlling hazards.
 - Incident investigation techniques, including root cause analysis.
 - How to evaluate the effectiveness of safety programs and organize the roles of faculty and support staff in safety processes and systems.
- Work with your risk management staff or loss control specialists from your school's workers' compensation or other insurance companies as you implement your plan.
 - Risk management staff and insurers can conduct inspections (see Section 1B) and provide recommendations for safety and health improvements.
 - Some insurers may be able to provide discounts or other financial incentives for taking steps to improve your safety and health program.
- Engage industry. Work with your program's industry advisory committees (IACs) and draw on their expertise to ensure that your safety and health program for your school reflects the highest industry standards and practices in which to train your students.
- Engage in continuous evaluation & improvement.
 - Identify safety and health measures to track and review, and ensure implementation of the written plan.
 - Evaluate these measures annually and make necessary program improvements.
 - Develop a list of safety-related responsibilities for administration, faculty, and staff. Ensure that these responsibilities become part of the job description and evaluation of all school employees.

Instructors



- Make sure you learn about your school's safety and health policy. This includes:
 - Who is in charge of safety issues
 - How to report hazards, injuries or near misses
 - What the investigation process is.



B

Regular Inspections to Identify Hazards

REGULARLY SCHEDULED, SYSTEMATIC INSPECTIONS allow programs to look proactively for hazards and potential hazards that may put your students, faculty, and staff at risk, and to prevent injuries or illnesses before they happen. Frequent regular inspections are an essential part of an effective safety and health program, particularly in high-hazard construction environments.

What This Looks Like

- Individual programs or departments conduct their own internal inspections to identify new and recurring hazards. Ideally, these inspections involve key administrators, instructors, and students. Inspection duties are rotated among different instructors, including instructors from other CTE construction programs, providing the benefit of a fresh set of eyes. Students can be involved at the classroom level.
- There is a system for sharing and tracking inspection results, to ensure and verify that any hazardous conditions identified are addressed.
- The school has a proactive liability and workers' compensation insurer that conducts regular inspections and communicates with administrators and others regarding any fixes or improvements needed.



Involving students in your inspections



“I want my students to learn to function in the same system they’ll experience in industry. To do inspections, I divide the students into teams. I use the NIOSH checklists, and break them down for each team to use a portion for an inspection. I make the connection for students: ‘This is the first step in the system—hazard identification and risk assessment. Then what’s needed if we find a problem?’ If a student finds something wrong during an inspection, they are expected to lockout the piece of equipment, if conditions warrant it. The safety info center in my shop has the startup and shutdown procedures for every piece of equipment in the shop.”

—Instructor

How CTE Construction Programs are doing

Many programs lack regular internal safety and health inspections.

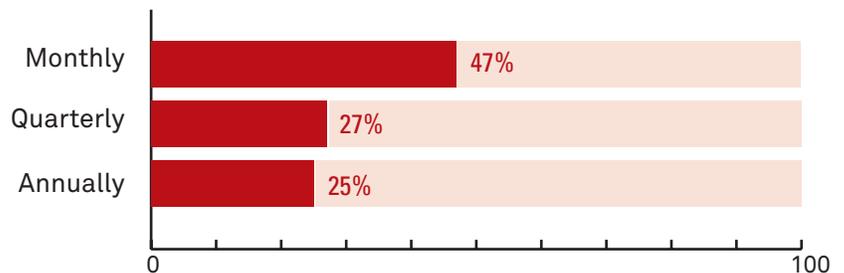
Only half of instructors reported that their programs regularly conducted internal safety and health inspections. Inspections that do occur do not regularly involve the range of participants that are needed in an effective SHMS. In terms of external inspections, only 35% of instructors reported that their school has some external entity conduct regular inspections of their facilities and classrooms, while 46% did not know if this happened or not. This may indicate that if such inspections are occurring, instructors are not involved in them.

50% of instructors reported that programs conduct regular internal inspections.

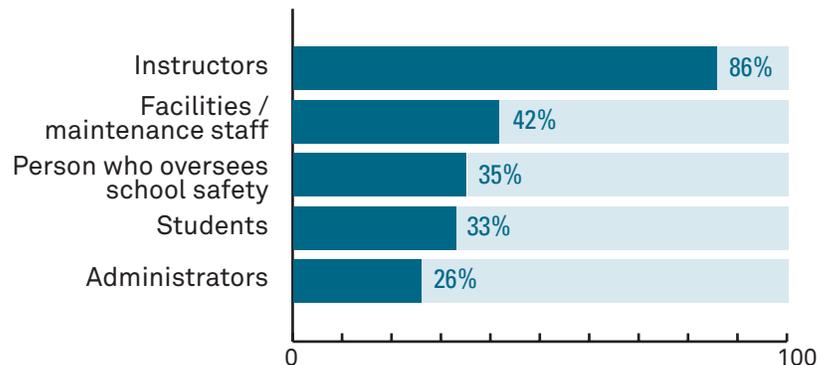
Outside entities conducting inspections (reported by instructors)

- Insurance companies (63%)
- OSHA consultation programs (35%)
- Private safety consultants (26%)
- Accrediting bodies (12%)
- Other agencies (12%)

Instructors report: How often are internal inspections conducted?



Instructors report: Who participates in internal safety & health inspections?

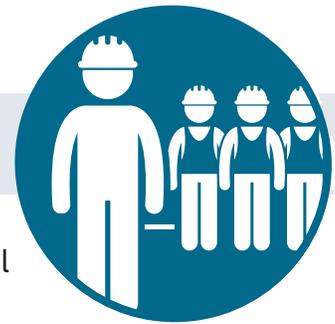


Administrators



- Establish a regular internal inspection schedule. Involve all of the following:
 - Instructors, taking the lead role
 - Administrators
 - Students, as a teaching and learning process
 - Industry Advisory Committee members
- Work with school administrators to establish a regular external inspection schedule with your school's liability or workers' compensation insurer, OSHA Consultation, or other entity.
- Ensure periodic monitoring of health hazards if necessary, for example, for exposures to noise ([CPWR Hazard Alert](#), [NIOSH Noise Checklist](#), [NIOSH Buy Quiet Program](#), [NIOSH Noise App](#), [NIOSH Noise & Hearing Loss Prevention](#)), welding fumes ([CPWR hazard alert card on welding fumes](#), [NIOSH Welding Checklist General Requirements](#)) or chemical hazards, or ergonomic risk factors ([CPWR compiled Ergonomic Guides & Checklists](#)). These hazards may cause long term health effects not immediately apparent.
- Establish a system to document inspections and any problems identified in writing, so that you can later verify that hazardous conditions have been corrected. See checklist tools on next page.

Instructors



- Work with your administration to establish a workable internal inspection process and schedule. Involve all of the following:
 - Instructors, taking the lead role
 - Administrators
 - Students, as a teaching and learning process. Use the [NIOSH Safety Checklist Program for Schools](#).
 - Industry Advisory Committee members
- Customize checklists or other tools that will help ensure thorough inspections [[NIOSH Safety Checklist Program for Schools](#)].
- Conduct periodic monitoring of health hazards if necessary, for example, for exposures to noise ([CPWR Hazard Alert](#), [NIOSH Noise Checklist](#), [NIOSH Buy Quiet Program](#), [NIOSH Noise App](#), [NIOSH Noise & Hearing Loss Prevention](#)), welding fumes ([CPWR hazard alert card on welding fumes](#), [NIOSH Welding Checklist General Requirements](#)) or chemical hazards, or ergonomic risk factors ([CPWR compiled Ergonomic Guides & Checklists](#)). These hazards may cause long term health effects not immediately apparent.
- Document your inspections and any problems identified so that you can later verify that hazardous conditions have been corrected. See checklist tools above.



An Active Reporting System to Identify Hazards

ANOTHER ESSENTIAL PART OF AN EFFECTIVE SHMS IS A hazard reporting system that all school employees know about and are encouraged to use. Faculty, staff, and students are often best positioned to identify safety and health concerns and to report close calls and actual incidents. A reporting system promotes workforce engagement in the regular practice of identifying and addressing hazards, which is:

- A critical skill for students to develop
- A part of demonstrating management commitment to employee involvement in the SHMS.

What This Looks Like

- There is a clear system for both school employees and students to report concerns and incidents. This may be two separate systems, but the system for students mirrors the system for staff.
- Everyone knows to whom or how they should report problems.
- When someone reports a problem, they are informed about the outcome. This encourages future reporting and demonstrates the program's commitment to ensuring a safe learning and working environment.

“Rather than OSHA, what about regular safety inspections on our own part...and a way to report the hazards you find...because a lot of times over the years, people bring stuff up but it falls on deaf ears and never gets addressed.”

–CTE Administrator

How CTE Construction Programs are doing

Most instructors and administrators reported that their schools had a system in place for school employees to report hazards.

However, it was also troubling that about 1 in 10 administrators and instructors did not know whether their schools had such a system. This may indicate that for some schools, the system is not fully functional or that more effective communication about the program is needed.



91%

of program administrators reported that there was a system in place for school employees to report hazards.

9%

did not know if there was such a system in place.



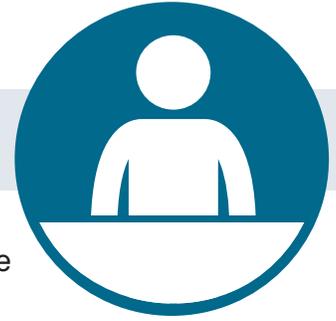
85%

of instructors reported that their school had such a system in place.

12%

did not know if there was such a system in place.

Administrators



- Establish a web-based form that can be completed by anyone to report safety and health issues, including hazards as well as close calls/near misses. [Sample Form](#)
 - Link the form to the designated safety administrator for the school (in the President's, HR, or Facilities Management Office), with notification to the departmental administrator.
 - Make all staff aware of the form yearly at convocation and in new employee orientation.
- Ensure that the resolution of reported safety and health issues is reported on a section of this web-based form.
 - Include a safety report in the school's internal newsletter, or other mechanism to inform staff and students of actions taken.

Instructors



- Make sure you know what your school and program hazard reporting process is; be sure to report on close calls/near misses.
- Communicate this process to your students. Have them practice filing a report.
- When students report hazards, make sure they are informed when the hazard is addressed.

Investigating All Injuries, Incidents and Near Misses to Identify Underlying Hazards

“You need to be good at learning from your mistakes—yours or others’. Whenever there’s a near miss, we stop and figure out what happened, why it happened. That’s an injury that could have happened.”
—Instructor

INJURIES, ILLNESSES, CLOSE CALLS, NEAR MISSES, AND reports of other concerns must be thoroughly investigated to identify hazards that are likely to cause future harm. The purpose of an investigation is to identify the root causes of the incident or concern, and to mitigate the hazard in order to prevent future injury and illness among students and staff.

What This Looks Like

- There is a clear written policy for conducting incident investigations.
- This will include a plan for who will be involved (relevant school staff, administrators, instructors, risk management or loss control specialists from your workers’ compensation or other insurance company, and students where appropriate).
- Investigations use a standardized reporting form that ensures a thorough investigation of the root causes of an injury, illness, or near miss.



How CTE Construction Programs are doing

A significant number of programs need to strengthen their injury and hazard investigation systems.

Approximately one out of four administrators did not know when their schools investigated employee reported injuries. One third of instructors did not know whether their programs investigated student-reported injuries. About 14% of administrators reported only serious employee injuries were investigated and 7% of instructors reported that student injuries were never investigated. For hazard investigations, 24% of administrators did not know when employee-reported hazards were investigated and 39% of instructors did not know when student-reported hazards were investigated. About 3% of administrators said employee-reported hazards are never investigated and 9% of instructors said student-reported hazards are never investigated.

64%

of schools always conduct investigations of employee injuries.

50%

of programs always conduct investigations of student injuries.

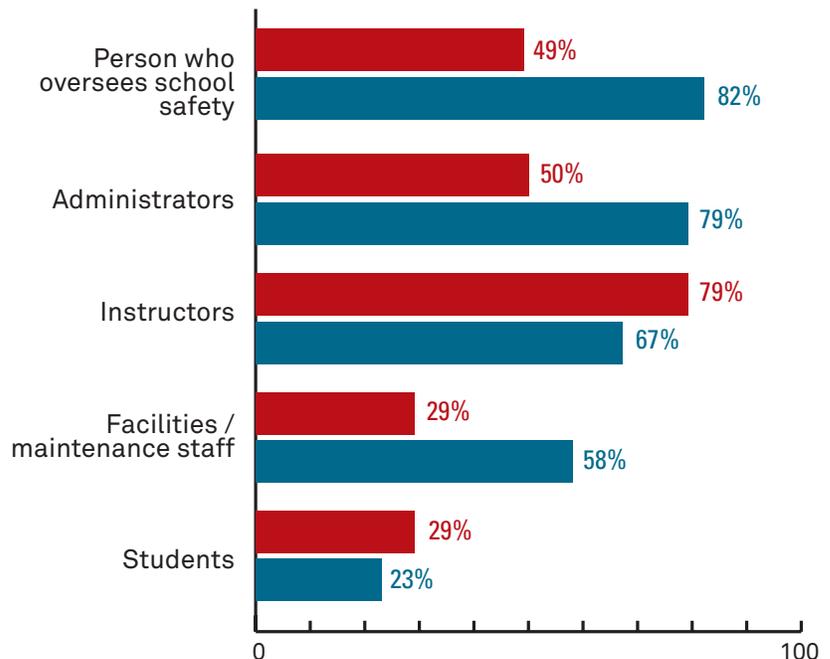
67%

of schools always conduct investigations of employee-reported hazards.

47%

of programs always conduct investigations of student-reported hazards.

Who Participates in Hazard or Injury Investigations?



Student-reported hazards or injuries



Employee-reported hazards or injuries

Administrators



- Establish procedures to investigate injuries, illnesses, close calls/near misses, and other hazards reported. You may need separate systems for students and for school employees.
 - [OSHA's Incident Investigation Guide](#)
 - [How to Conduct an Incident Investigation, National Safety Council](#)
- Train a team to investigate incidents.
 - The team should include faculty, administrators, and students as appropriate.
 - Involve outside expertise if necessary.
 - Use an [incident investigation form](#) that helps identify root causes.
- Communicate the results to administrators, instructors, students, Industry Advisory Committee members, or other school employees.
 - Discuss root causes of incidents in school or community college internal newsletter and with students, making sure that the privacy of those involved is protected.

Instructors



- Ensure that your school and program investigation procedures are followed in your classroom.
- Add “near misses/close calls” to incidents requiring investigation, even if they are not included in your school or program’s procedures.
- Engage students in the investigation process whenever appropriate. Use an incident investigation form that helps identify root causes.
 - [OSHA's Incident Investigation Guide](#)
 - [How to Conduct an Incident Investigation, National Safety Council](#)
 - [Accident Investigation Tool, UC Berkeley LOHP](#)

Controlling Hazards Effectively to Prevent Injuries

PROMPTLY AND SYSTEMATICALLY ADDRESSING HAZARDS completes the cycle that began with identifying hazards through inspection, reporting, and investigation systems and processes.

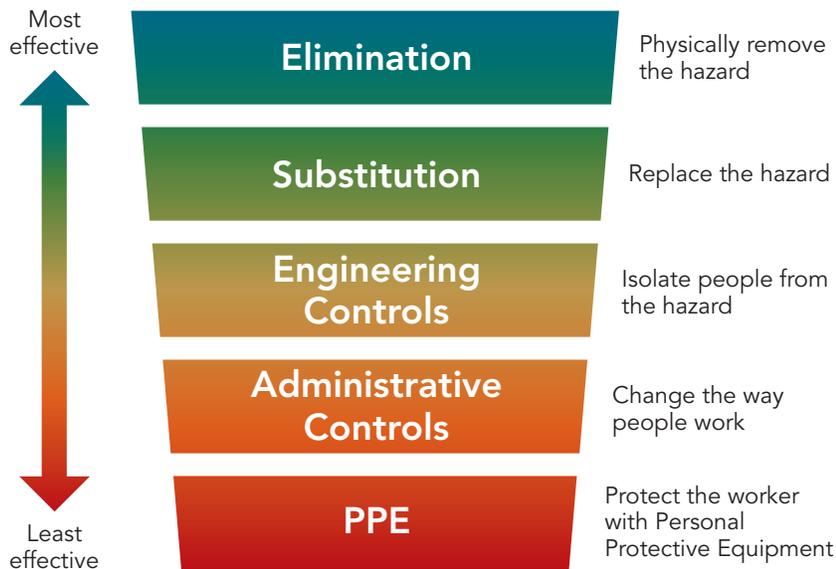
What This Looks Like

- Schools and programs take immediate action to control imminent hazards and put interim controls and a plan in place for addressing long-term issues. This includes issues such as noise, chemical exposures, respiratory hazards, and ergonomic hazards.
- The best controls are feasible, effective, and permanent. This means that whenever possible, solutions should be selected that eliminate or engineer out the hazard, and do not rely on workers following rules or wearing protective gear. Use the “The Hierarchy of Controls”. (See Box on page 32.)

“We’ve actually gone through and made it so the lights in the booth won’t turn on until you’ve turned on the ventilation system, so that actually gets you in the habit of turning on the ventilation system because you can’t see until you get your ventilation turned on.”

–Instructor

Prioritizing Controls: The Hierarchy of Controls



Source: NIOSH (<https://www.cdc.gov/niosh/topics/hierarchy/default.html>)

Not all controls for addressing hazards are equally effective. The “hierarchy of controls” is a tool that helps people think about the best ways of addressing safety and health hazards.



The most effective solutions at the top of the pyramid are those that actually eliminate the hazard. **An example of this is pre-building roof trusses on the ground before installation, which eliminates the work at height for that task.** Administrative controls (work procedures) and relying on personal protective equipment only reduce or limit the worker’s exposure. Often a combination of methods is needed to get the best protection.

How CTE Construction Programs are doing

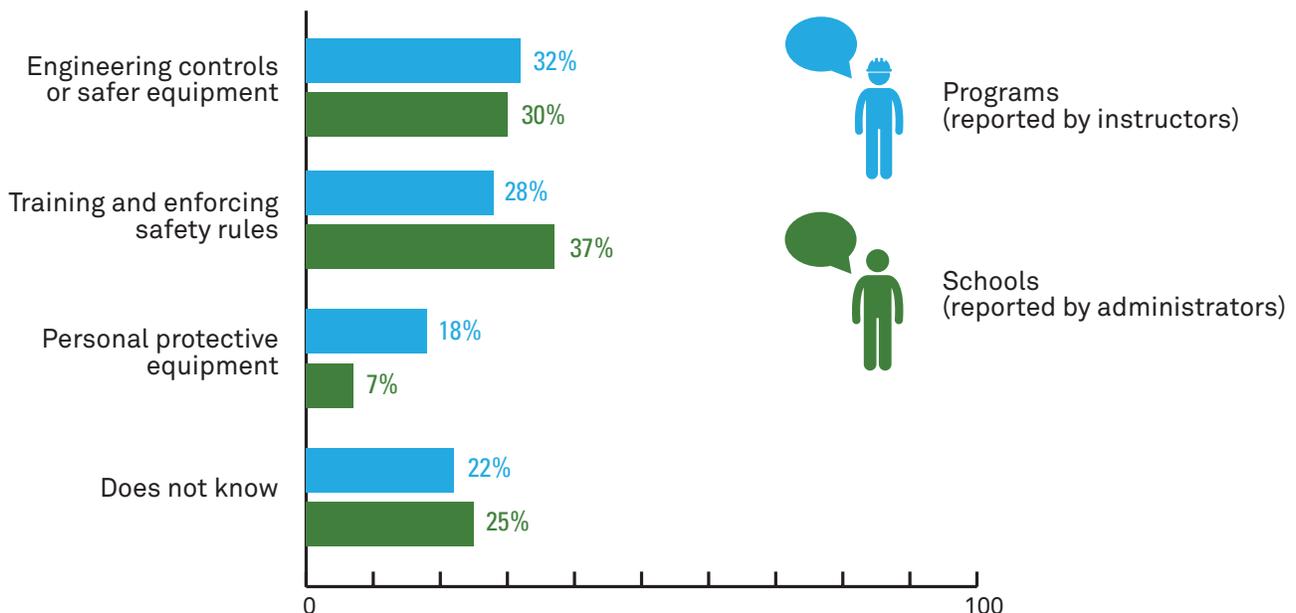
Most instructors and administrators agreed that their classrooms have safe, up-to-date equipment.

86% of program administrators and 91% of instructors agreed or strongly agreed that their classrooms have safe, up-to-date equipment. 71% of instructors agreed their programs provide all necessary PPE for students. When asked about barriers to providing effective safety and health education to students, however, 51% of instructors noted that lack of resources for equipment that meets industry standards was at least sometimes a barrier.

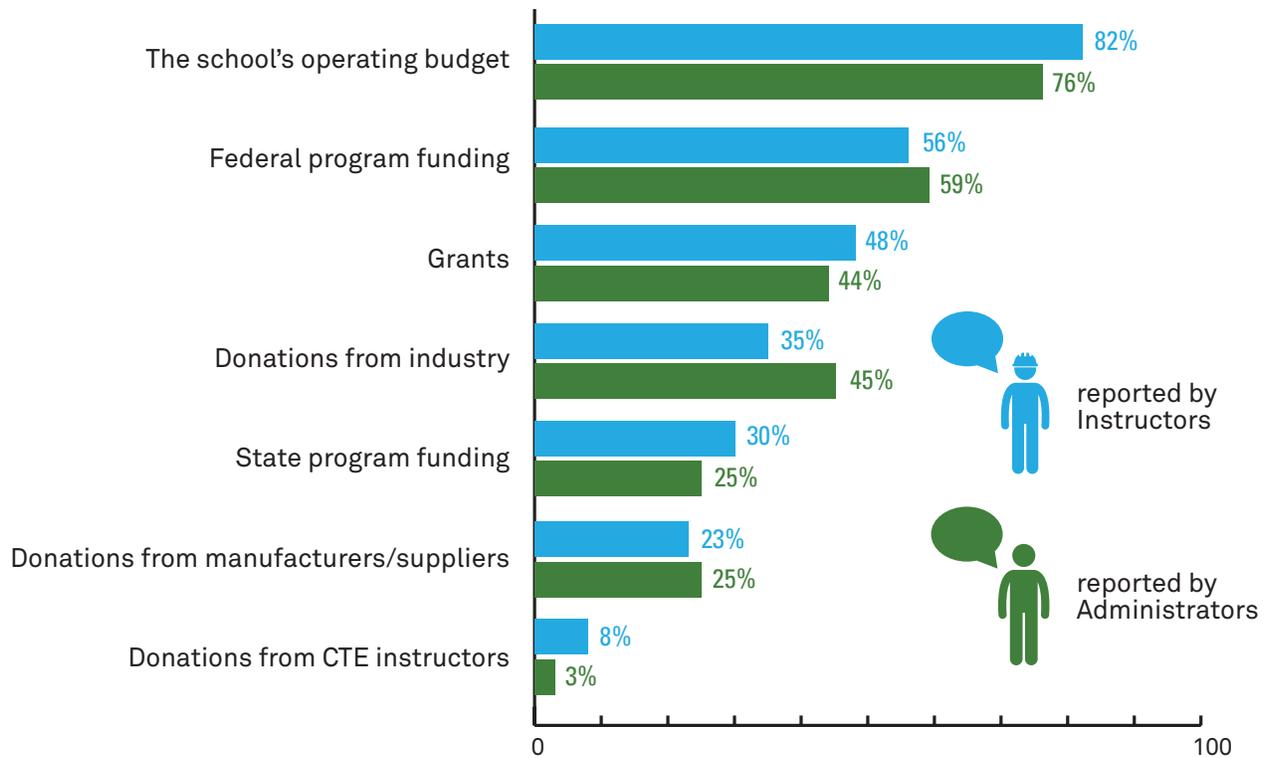
Many programs need to prioritize more effective solutions at the top of the “hierarchy of controls” when addressing hazards.

Less than a third of administrators and instructors reported that their school or program prioritizes engineering controls or substituting safer equipment. Most administrators (91%) agreed or strongly agreed that their school addressed hazards in a timely manner and 69% of instructors agreed or strongly agreed that their programs addressed hazards in a timely manner.

How does your school or program prioritize safety & health solutions?



Main sources of funding for equipment in CTE construction programs



What One School Does: Engineering Safer Systems in a Welding Lab



The welding lab at one community college used a virtual reality arc welder trainer as part of students' training. The machine allows students to practice welds virtually on a system that includes a virtual view of the welding metal. The large television screen enables an entire class to view welds in progress, while measuring metrics such as travel speed, work/travel angle, and arc length. The system also simulates sparks, slag, grinding (on pipe) and weld cooling. By making the cuts virtual, the system reduces energy consumption, waste, scrap, and time. Even more importantly, it makes active learning safer. Using this virtual trainer, students can do their initial learning of welding techniques without many of the hazards in a traditional welding shop.

Administrators



- Fix anything that can be taken care of immediately.
- For more complicated issues, identify control options. Find out what other schools are doing. Work with your Industry Advisory Committees. Work with instructors, your school's risk managers or [insurance loss control specialists](#), [OSHA consultation](#), or your state OSHA consultation program.
- Develop a plan to fund and implement any long term controls that are needed.
 - Research vendors/cost
 - Decide on equipment
 - Plan for installation
 - Assess effectiveness
- Ensure that the resolution of reported safety and health issues is reported back to staff and students.
 - Include a safety report in the school or community college's internal newsletter, or other mechanism to inform staff and students of actions taken.

Instructors



- Follow up with the appropriate school or program administrator on any classroom hazards that have been identified to ensure they are being addressed.
- Report back to students on any hazards that have been addressed in the classroom, especially if students have identified these hazards.



Instructor Qualifications and Support

2

INSTRUCTORS—BOTH FULLTIME AND PART-TIME/ adjunct—are the linchpin in your CTE construction program’s overall system for safety, and in the safety and health education of your students.

Instructors in CTE construction programs need both strong trade experience as well as effective teaching skills to do their job well. Those who know from experience the hazards encountered on the job, potential solutions, how to get solutions implemented, and potential barriers can better design courses that anticipate and prepare students to effectively respond to those conditions.

CTE construction program administrators need to actively support instructors in skill-building, professional development, and activities that enable them to stay up-to-date in their technical trade skills, including safety and health, and in their teaching skills. Programs also need to encourage instructors to draw on the expertise of Industry Advisory Committee members to help keep current on advancements in safety and health and other industry standards.

This section focuses on:

- **Instructor field experience**
- **Training and support to be effective instructors**
- **Training and staying up-to-date in safety and health**
- **Support for engaging Industry Advisory Committees (IACs)**

“I can hire somebody that’s been on the job for twenty years, hell of a carpenter, knows everything, but not how to teach, you know.”

–CTE Administrator

Instructor Field Experience

“Those who have witnessed death and dismemberment on the job and instruct with face-to-face, hands-on methods are still the best for our industry.”

WHILE CTE CONSTRUCTION PROGRAMS TYPICALLY prioritize trade experience, many do not require training or experience in teaching or pedagogy. The key to having a strong program is to have well-qualified instructors with both trade-specific field experience as well as teaching expertise. Field experience is covered in this section.

What This Looks Like

–Instructor

- **Field experience in their trade**—Instructors have at least 5 years of field experience in their trade and possess corresponding, recognized industry certifications. Ideally, they also have had some safety and health and/or supervisory experience in which they have managed work and safety and health on the jobsite.



How CTE Construction Programs are doing

All programs require instructors to have some level of field experience.

No program in our survey required less than 2 years of field experience for their instructors and 48% required at least 5 years of such experience. Instructors in our survey averaged 23 years of field experience, with 97% reporting they had at least 5 years of such experience in their trade. 74% of programs required instructors to have industry certifications prior to being hired.

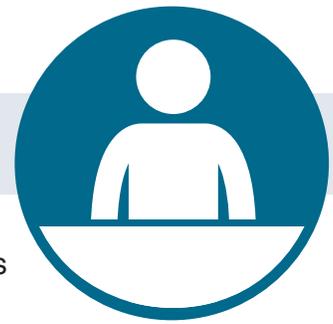


48% of programs required instructors to have **2–4 years** field experience.

52% of programs required instructors to have **5 years** or more field experience.



Administrators



- Review your program and school's accreditation requirements for instructor experience. Update your program requirements to ensure that they include the following:
 - 5 years of relevant trade experience. Check with apprenticeship programs in your area ([U.S. Dept. of Labor Apprenticeship Toolkit](#)) for the range of skills needed for that specific trade ([carpentry apprentice example](#)).
 - Relevant industry certifications
 - Teaching experience or equivalent teacher training (see Section 2B)



B Training and Support to be Effective Instructors

BEING AN EFFECTIVE EDUCATOR MEANS NOT ONLY instructing students on technical skills (e.g., how to weld), but being able to teach students with varying aptitudes and helping them become truly competent in a skill (e.g., complete required welds safely and efficiently).

Some construction CTE instructors enter the classroom with previous teaching experience while many others do not. However, even instructors with good natural instincts for teaching, or with previous experience, can become better teachers with ongoing professional development.

What This Looks Like

- The school or program requires and pays for instructors to participate in regular professional development to hone their skills as educators, through in-service workshops at the school or education conferences. This is a top priority for new instructors without previous teaching experience.
- Instructors are proficient in:
 - Developing clear learning outcomes
 - Using a range of effective materials and activities that meet diverse learning styles and facilitate communication, leadership, and other [21st Century Framework Skills](#)
 - Engaging in effective assessment
- New instructors, including adjunct faculty, participate in a formal mentorship program with an experienced CTE construction instructor.

“Instructors must attend three conferences each year specific to their field. Every new teacher for the first three years goes to classes provided by the school. They learn about teaching technology and instructional preparedness, lesson plans, curriculum development, etc. I also observe their teaching, and I do reviews at an accelerated level in their first few years of being a faculty member.”

–CTE Administrator

How CTE Construction Programs are doing

Instructors received support for and some training in teaching techniques and effectiveness.

Administrators placed a high priority on supporting instructors to develop their instructional skills, particularly in developing appropriate student assessments (71%), using technology in the classroom (65%), and classroom management techniques (60%).

Administrators also reported providing support for instructors to conduct effective safety and health instruction through developing clear learning objectives (86%) and instructional activities (65%), as well as providing paid time to update course content with new best practices (62%).

When asked about their preparation for teaching generally, instructors reported receiving the most training (either before or during their teaching career) on: how to teach problem solving; developing learning objectives; developing student assessments; and effective speaking/presentation skills.

Instructors need more targeted training and support for developing effective occupational safety and health (OSH) instruction.

One-quarter of administrators reported their programs do not provide instructors with help in developing OSH instructional activities or materials, and one-third said instructors are not given paid time to update the OSH content in their courses. Preparation in basic areas of teaching effectiveness could be bolstered as there was no area in which the majority of instructors felt they had “a great deal” of training.

More programs need to provide mentoring to new and current instructors, including adjunct or part-time faculty, on the best ways to teach safety and health.

Only 27% of instructors said they received mentoring in how to deliver effective safety and health education from someone at their school when they first began teaching. Almost a third of instructors said they currently receive mentoring on OSH education from someone in their school, and over a third receive this mentoring from outside their school. They rated the quality of all of this mentoring highly.

FROM OUR RESEARCH

Training in Being an Effective Educator, Before and During CTE Career

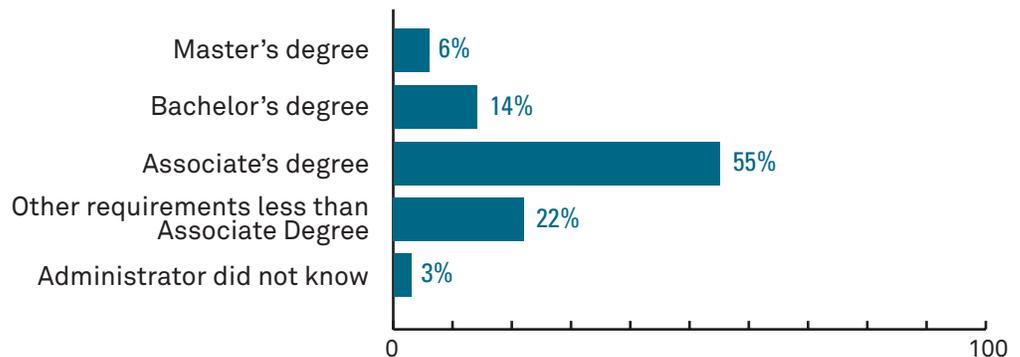
Where instructors reported “a great deal” of training:

- How to teach problem solving (43%)
- Developing learning objectives (42%)
- Developing student assessments (42%)
- Effective speaking/presentation skills (42%)

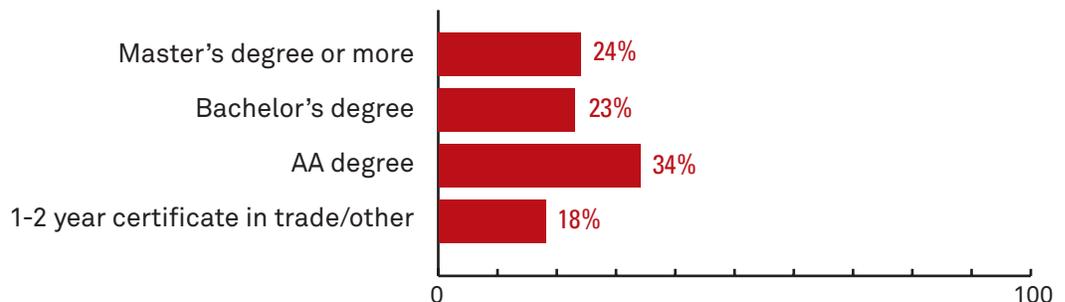
Where instructors reported no training:

- Teaching self-advocacy skills (23%)
- Developing student-led activities (14%)
- Collaborative or group projects (12%)
- Teaching communication skills (11%)

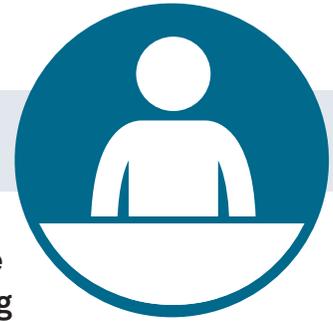
What level of educational attainment are instructors required to have?



What is the educational attainment of instructors?



Administrators

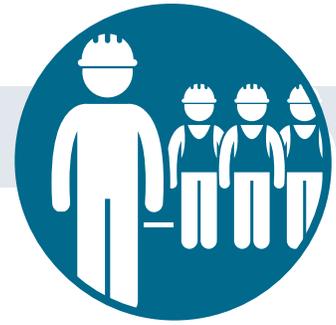


- **Identify resources and opportunities both within and outside your institution to ensure the development of strong teaching skills**, such as in-services or conferences. Resources:
 - [CTE Teacher Coaching and Support through CAROCP: The Association of Career and College Readiness Organizations](#)
 - [Association for Skilled and Technical Sciences \(ASTS\): High Quality CTE certification program](#)
 - [Association for Career and Technical Education \(ACTE\): CareerTech VISION](#)
 - [SkillsUSA.org](#)

- **Provide instructors with professional development** on writing safety and health learning outcomes, assessments, and assessment rubrics. Resource: [CTE Online](#)

- Establish a mentoring program for new instructors.

Instructors



- **Identify resources and opportunities to strengthen and update your teaching skills. Resources:**
 - [CTE Teacher Coaching and Support through CAROCP: The Association of Career and College Readiness Organizations](#)
 - [Association for Skilled and Technical Sciences \(ASTS\): High Quality CTE certification program](#)
 - [Association for Career and Technical Education \(ACTE\): CareerTech VISION](#)
 - [SkillsUSA.org](#)

- **Make sure that safety and health teaching skills are included in your professional development plan.**
 - [ASTS High CTE certification program Professional Development Plan](#)

- **Flag safety and health for your administrator as a specific area you would like feedback on in your evaluations.**



Training and Staying Up-to-date in Safety and Health

“Education is key. That includes training for the educator. [I will] be attending OSHA Training this Fall.”

–Instructor

INSTRUCTORS HAVE THE MOST CRUCIAL ROLE IN ensuring that students develop essential safety and health skills. In order to do this, instructors need to have specific training in relevant safety and health issues. A well-known, if imperfect, standard in the industry is the OSHA-authorized 10-hour and 30-hour training program for the construction industry. (See Box on page 47 for an explanation of OSHA training courses. See Box on page 65 in Section 3B on Why the OSHA 10?)

Instructors also need to stay up-to-date on the latest practices and information about safety and health that will best protect students when they are in the field.

What This Looks Like

- Instructors in CTE construction programs all have the OSHA 30-hour construction safety training. This will strengthen their safety and health understanding, and they will be better able to integrate the information into coursework.
- All instructors who have the required construction safety experience have taken the OSHA-500 and 510 construction safety courses and are authorized to teach the OSHA 10 and OSHA 30.
- Programs require instructors to identify safety education and training priorities in their Professional Development Plans (PDP).

- Programs provide financial support for continuous and ongoing professional development on occupational safety and health for instructors.
- Safety and health management and teaching are included as a component of instructor evaluations. This includes instructors' ability to develop clear OSH learning objectives and instructional activities, as well as providing a safe learning environment.

OSHA 10? OSHA 30? What do all the numbers mean?



OSHA Outreach and Training Courses in Construction

The OSHA Outreach and Training Program offers voluntary safety and health training for workers and contractors. These programs teach recognition, avoidance, abatement, and prevention of safety and health hazards in workplaces in the construction industry. The programs also provide information regarding workers' rights, employer responsibilities, and how to file a complaint. Several states, localities, and many contractors require workers to have an official OSHA 10 card to work on construction projects.

OSHA 10-hour: Intended for workers to provide awareness of common job-related safety and health hazards

OSHA 30-hour: Intended for supervisors or workers with specific safety responsibility

OSHA Course #500: Trainer Course in OSHA Standards for Construction—prepares trainers to teach the 10- and 30-hour construction safety and health content to others, and issue OSHA 10 or 30 cards to their trainees. (minimum contact hours: 26)

OSHA Course #502: Update for Construction Industry Outreach Trainers who have completed Course #500. (minimum contact hours: 18)

OSHA Course #510: Occupational Safety and Health Standards for the Construction Industry – covers OSHA policies, procedures, and standards, as well as construction safety and health principles. (minimum contact hours: 26)

How to become an authorized OSHA 10 & 30 instructor



In order to become an authorized OSHA 10 trainer, an instructor needs to meet these prerequisites:

- Have five years of construction safety experience. Obtain guidance on whether you meet this requirement from the [OSHA Training Institute \(OTI\) Education Center](#) where you want to take the training.
- Complete OSHA [Course #510](#), Occupational Safety and Health Standards for the Construction Industry.

After completing these, the instructor must take OSHA Course #500. They must attend an OSHA Course #502 update course once every four years to maintain their trainer status.

Training for Adjunct or Part-time Faculty



Adjunct or part-time faculty often play a core role in providing educational knowledge, skills-development, and mentorship to students. Adjunct faculty need to be supported as instructors, including making sure adjunct instructors meet field experience, education, and teaching experience requirements. Similarly, it is important to support adjuncts' growth to become more effective instructors and to stay up-to-date in safety and health.

“Adjunct are notified that they’re allowed to come (to professional development workshops), but they don’t make it mandatory. I have a problem with that, because if you’re a faculty member, whether full or part time, you still need to know all that.”

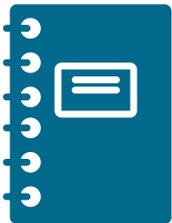
–Instructor

How CTE Construction Programs are doing

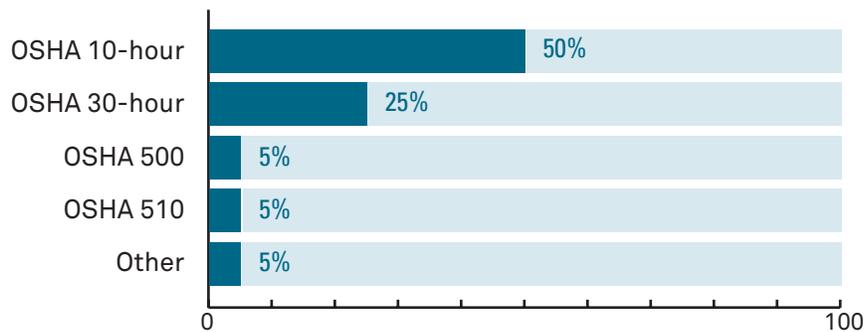
More instructors need to receive OSHA 30 training or become authorized OSHA Outreach Trainers.

Only 1 in 4 administrators reported their programs require the OSHA 30-hour course for their instructors, and just 5% require instructors to be authorized OSHA Outreach Trainers (OSHA Course #500), enabling them to teach the OSHA 10 or 30. Just under half of the administrators reported instructors in their programs are required to take the OSHA 10-hour course.

Approximately 29% of instructors reported they have no OSHA safety and health training. Only 18% of instructors reported taking the OSHA-500 trainers course. Instructors who reported having some kind of OSHA training included a range of “other OSHA courses”, including forklift safety, lock out/tag out, fall protection, confined space, and hazard communication, and other general industry OSHA training.

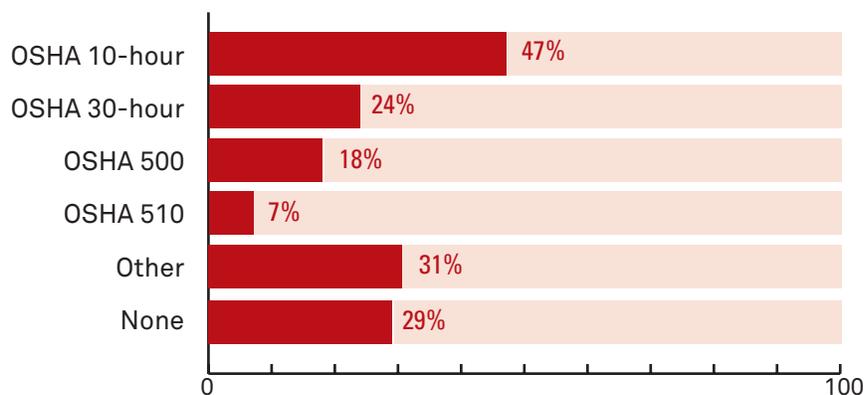


What OSHA Courses do programs require for instructors?



Administrators report

What OSHA Courses have instructors taken?



Instructors report

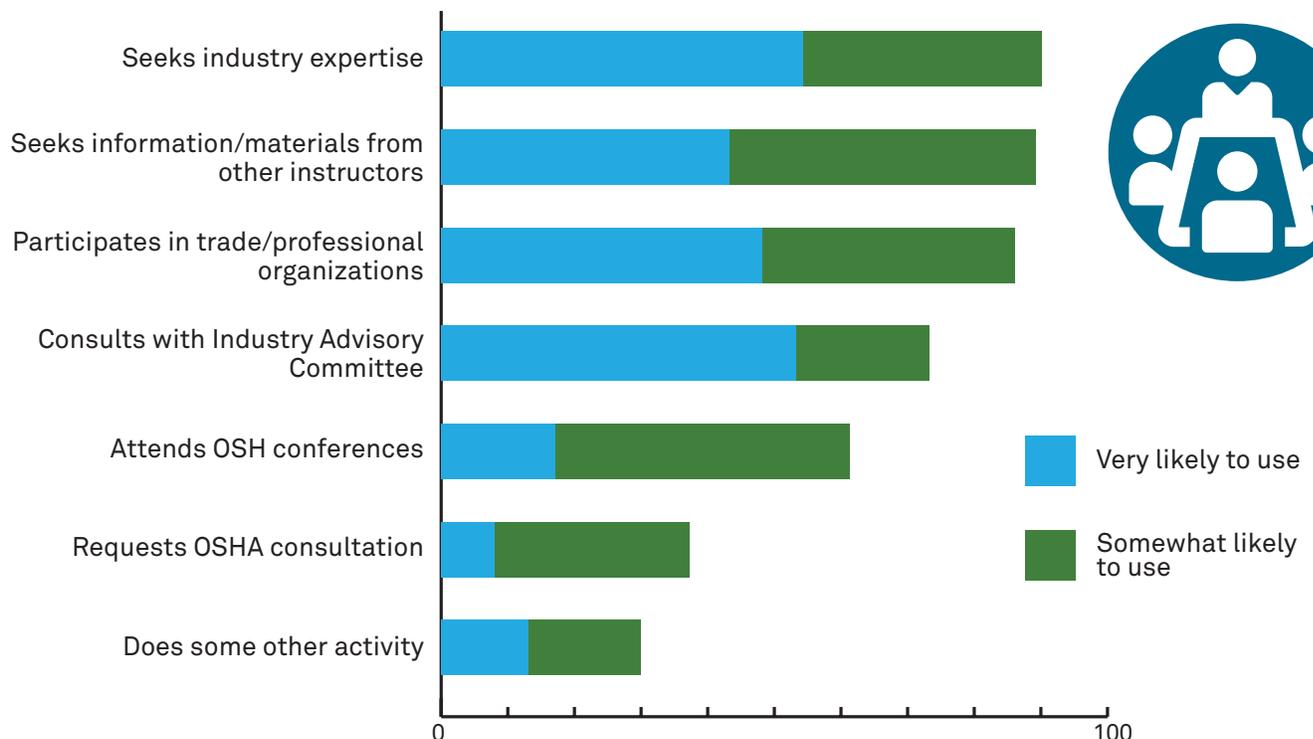
FROM OUR RESEARCH

Programs provide support for professional development but more programs need to require OSH priorities in professional development plans (PDPs).

Approximately 75% of administrators reported that instructors are required to have a professional development plan (PDP), and most administrators reported providing paid time for instructors to participate in a range of professional development activities. In programs that require a PDP, however, only about a third of administrators reported instructors are required to include activities that help them stay current on best safety and health practices in their trade. Instructors appear to be more proactive with about two thirds of those who are required to have a PDP reporting they “often” or “always” include OSH activities in their plan (one out of three said they do so “sometimes”). Just over half of instructors reported they sometimes or often have insufficient time for professional development. Nearly two-thirds of administrators reported that instructors in their programs are evaluated on the quality of their OSH instruction.

Instructors reported a broad variety of activities they are engaged in to stay up-to-date in OSH best practices—see Box below.

Instructor reported practices used to stay up-to-date on new best OSH practices in their trade

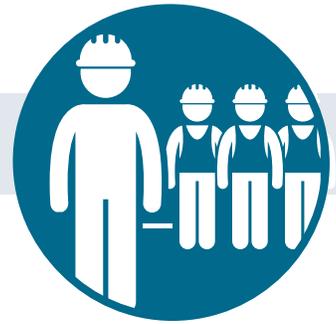


Administrators



- **Ensure that all instructors have taken the OSHA 30 for construction**, even if your regional accrediting body does not require it.
 - About the [OSHA 10 and OSHA 30 Outreach Training Program](#)
 - Details about [program content](#)
 - To [find a training center](#)
- Ensure that all instructors who have the required construction safety experience have taken the [OSHA Course #500/510](#) series to become authorized OSHA trainers within the first five years of employment.
- Require all instructors to include safety and health goals in their professional development plans.
- In instructor evaluations, include safety and health management and instruction as a component.
 - Observe safety and health management in the classroom:
 - Does it reflect key SHMS elements such as inspections, addressing hazards, ensuring student compliance with safety practices?
 - Do students play an active role in inspections and other key SHMS elements?
 - Is safety and health instruction integrated into the curriculum with appropriate learning outcomes and assessments?
- Budget each year for instructors' safety and health professional development (using Perkins funds—federal funds used by most CTE programs—or other professional development funds).

Instructors



- Request funding to take the OSHA 30 for construction, even if it is not required by your regional accrediting body.
 - About the [OSHA 10 and OSHA 30 Outreach Training Program](#)
 - Details about [program content](#)
 - To [find a training center](#)
 - If you have the required construction safety experience (see Box on page 48), request funding to take the [OSHA Course #500/510 series](#) to become an authorized OSHA trainer.

- Include safety and health goals in your Professional Development Plan.



D Support for Engaging Industry Advisory Committees (IACs)

INDUSTRY ADVISORY COMMITTEES (IACS) are critical partners in CTE, bringing invaluable community and industry expertise, experience, and resources. All CTE programs receiving Perkins funding are required to have a technical education advisory committee that involves business, labor and industry. The role of this committee is to advise educators on the design, development, implementation, evaluation, maintenance and revision of technical/occupational programs within a career pathway.

CTE administrators and instructors who effectively engage their IACs in developing their safety and health systems and education are best positioned to prepare students for the safety systems and practices they will encounter in the construction industry.

“Our programs put safety first, and everything else second. It’s driven by the IAC; they don’t want new hires that get hurt. As an academic institution, we hold Industry Advisory meetings for every program we offer. We use that opportunity to speak directly with industry professionals in those fields.”

–CTE Administrator



Instructors Get Support to develop IAC

“When I first got here, I recognized that we needed a strong advisory council. So I charged all my instructors to build their IAC to approximately 12-15 members. We allow instructors Industry Visit Days. They go out and they specifically find new folks to add to the mix. They obviously work with their existing relationships, too. We are really fortunate in the programs we offer, we have a really strong job demand. We are constantly in contact with employers, because they are begging for our graduates.”

– CTE Administrator

What This Looks Like

- IACs have clear expectations for engagement, how often they will meet, what their roles will be. Members should include participants who are actively engaged in training in their own organizations, from both labor and industry.
- Instructors receive paid time to recruit, and engage regularly with IAC members, including visiting their worksites.
- IACs are involved in a range of program safety and health activities, including:
 - Guiding curriculum content and development, providing real-life OSH case examples, and serving as guest speakers
 - Helping to set high goals and standards for instructor safety and health training, professional development, and evaluation
 - Participating in program and school health and safety committees and program safety audits and investigations
 - Providing safe, quality job or internship opportunities for students
 - Providing externship opportunities to instructors that allow them to deepen their understanding and keep current in the field
- Members of IACs have adopted high OSH standards in their own workplaces to protect workers, and serve on the IAC to provide support for quality education and training that leads to the development of safety and health employability skills.

How CTE Construction Programs are doing

Industry Advisory Committees are being leveraged well in about half of programs.

Fewer than half of instructor respondents felt that their Industry Advisory Committee (IAC) had strong, regular, and effective industry engagement, and just over half said they were “very likely” to consult with their IAC to stay up-to-date on best OSH practices. On the positive side, most administrators reported that their instructors do receive paid time to work with their IACs, so there are resources available for improvement in this area. Instructors rated their IAC’s support for safety and health issues highly.

How instructors rate their IAC’s support for OSH resources

Helps instructors stay up to date on safety and health



3.8 average



53% of instructors say they are very likely to consult with their Industry Advisory Council to stay up to date on best safety and health practices.

Advocates for safety and health resources at the school



3.8 average



87% of administrators reported that instructors receive paid time to work with their Industry Advisory Committee.

Gives input on safety and health skill assessment



3.7 average

Instructor assessment of Industry Advisory Committee engagement

43% say:



IAC has strong industry engagement, meets regularly with good attendance, and is critical to program success

24% say:



IAC has some industry engagement, sporadic meeting attendance, and provides some support when needed

8% say:



IAC has limited participation by industry partners

24% say:



Couldn't assess their IAC

Administrators



- Establish concrete expectations for instructors regarding IAC recruitment and engagement for all programs.
 - IACs meet 2-4 times per year.
 - Instructors engage on the jobsite with IAC members at least twice year.
 - Members reflect current industry needs in your community, and include both labor and industry representation.
- Provide paid time to instructors to recruit and engage with IAC members.

Instructors



- Clarify expectations for IAC members, invite them to participate in specific tasks and roles related to safety and health (see ideas above in “What this looks like”), and hold them accountable.
 - The [Minnesota State Colleges & Universities’ Program Advisory Committee Handbook](#) provides useful guidance for setting up effective IACs.
- Engage IACs in providing instructor externship opportunities to experience on-the-job OSHA consultation or inspections.



Effective Teaching and Learning

3

CTE CONSTRUCTION PROGRAMS THAT ACTIVELY integrate recommended safety and health management system practices into the classroom expose their students to the highest industry standards in their learning environment while also protecting them in the classroom.

This section highlights key steps instructors can take to ensure the best learning and safest learning environment for their students.

- A. **Curriculum content is up-to-date and reflects core safety and health competencies**
- B. **OSHA 10 training is included, is well-integrated, and taught effectively**
- C. **Safety and health skills are taught effectively and the classroom reflects safety & health management system recommended practices**
- D. **Students learn self-advocacy and problem-solving skills for the workplace**

“Having a specific advisory committee for the curriculum keeps the learning objectives relevant to what the contractors or local industries need or some of the trends.”

–Instructor

Curriculum Content is Up-to-Date and Reflects Core Safety and Health Competencies

Core Occupational Safety and Health Competencies



Identify and describe safety AND health hazards in construction

Demonstrate understanding of hierarchy of controls

Demonstrate ability to protect self and others from key hazards

Conduct a job hazard analysis

Explain worker rights/ employer responsibilities under OSHA

Demonstrate effective communication and self-advocacy skills

Describe potential emergencies and emergency response procedures

REVIEW OF INDUSTRY AND SAFETY AND HEALTH education standards and consultation with experts in the field identified Core Occupational Safety and Health Competencies, listed in the Box on this page. A full, more detailed list can be found in the appendices.

A CTE construction curriculum needs to reflect activities and content that prepare students in all of these areas, and there needs to be a system for ensuring that this content stays up-to-date, through engagement with industry.

What This Looks Like

- Curriculum is reviewed annually with the Industry Advisory Committee (IAC).
- Curriculum is adjusted to reflect industry changes and new developments in safety and health, as well as any gaps or needed improvements identified by the instructor through student assessments or IAC feedback.
- The curriculum includes specific educational activities designed to teach the core occupational safety and health competencies as skills that students practice. This includes less obvious safety and health issues, such as exposure to noise, respiratory hazards, and body mechanics, as well as communication and self-advocacy skills, described in Section 3D.

How CTE Construction Programs are doing

Almost all programs reported that their curricula were reviewed regularly to ensure alignment with industry occupational safety and health (OSH) standards.

Instructors reported updating course OSH content. Some programs conduct these reviews with more frequency than others. About half of the administrators reported their programs conduct curriculum reviews annually while 15% conducted reviews only every 5 years. Nearly all administrators reported involving their Industry Advisory Committees in the process, although about a third of instructors also reported that in general, their IACs were not strongly engaged in their programs (see page 55, Section 2D).

Key gaps in curriculum content included the hierarchy of controls, job hazard analysis (JHA), and self-advocacy and communication skills.

Instructors reported spending more time on teaching students about safety procedures and using proper PPE than they did on more upstream solutions to safety problems and critical thinking skills needed to apply them, such as how to conduct a job hazard analysis or understanding the engineering and administrative controls that employers should have in place. Sections 3C and 3D describe the kinds of activities instructors conducted. While the survey did not assess whether relevant health issues are covered adequately in each trade, focus groups and site visits primarily reflected coverage of specific safe practices and use of PPE.

95% of instructors reported that they update their course content if they learn of new best safety and health practices in their trade.

What activities did administrators report to keep curriculum aligned with industry OSH standards?

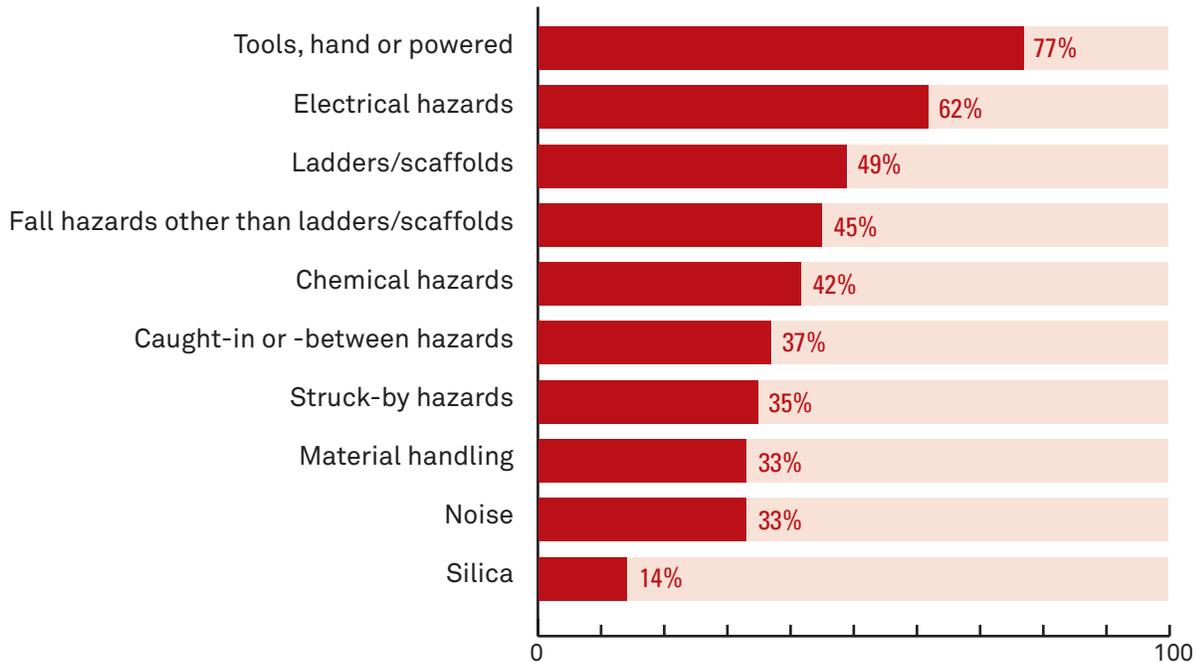


- IAC reviews the curriculum (95%)
- Program reps visit internship sites (65%)
- Industry Reps review the curriculum (51%)

FROM OUR RESEARCH



What OSH hazards do instructors report spending more than one hour covering in trade skill courses?



What One School Does—IAC helps evaluate program through student interviews

“Our IAC typically meets twice a year. The second meeting of the year is an exit interview. The members meet with students, talk to each of the students before they graduate. We use it to gather information about how to improve our program. It’s a good time for students to bring up safety hazards we weren’t addressing. They meet privately with the students without the instructors, so they can talk about anything.”

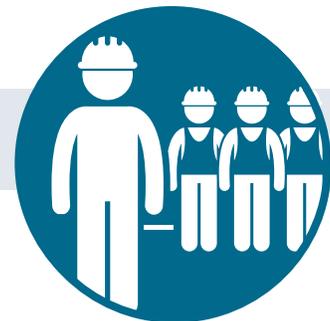
—Instructor

Administrators



- Establish a policy with lead instructors regarding annual curriculum review that includes:
 - Review by IAC
 - Report backs on curriculum updates or changes (ask specifically about OSH-related changes)
 - Reference to the Core OSH Competencies to ensure that skills and topics are adequately addressed across the curriculum
- Invite faculty to form a committee to review OSH content of the whole curriculum using competencies. Hold instructors accountable to this process during annual reviews.

Instructors



- Review curriculum to ensure that the safety and health competencies listed above are covered, and that these skills are infused throughout the program, and not just in a stand-alone safety course (see Section 3B).
 - Cover health hazards relevant to the trade, including ergonomic hazards, chemical exposures, other respiratory hazards, and noise.
 - Where industry work processes are taught for which [OSHA requires specific training](#), ensure that those OSHA training requirements are met, before those processes are carried out.
- Have the IAC review and evaluate the curriculum every year to ensure that OSH competencies being taught reflect any changes in industry standards, OSH regulations, or hazard control improvements in the trade.
- Participate in a faculty committee to review OSH content of whole curriculum using the competencies.

B OSHA 10 Training is Included, Well-integrated, and Taught Effectively

“We do hands on with OSHA 10. Fire up the grinders and the saws. Put on the harnesses. Climb up the ladders, lean them up against the building. It’s not just sit there and death by PowerPoint.”

–Instructor

MANY CTE CONSTRUCTION PROGRAMS ARE INTEGRATING or requiring the OSHA 10-hour Construction Training Program (OSHA 10) for their students. See Box on page 65.

OSHA 10 training may be taken online, in a stand-alone course, or integrated into a trade skills class, but it must be taught by an authorized OSHA Outreach Trainer in order for students to receive a card. In order to be most meaningful, however, the OSHA 10 content should be taught in a way that is integrated with the skills that students are learning, with adequate class time to use effective, participatory teaching methods (see Box on page 66).

Instructors mentioned two programs that are used, in addition to the OSHA 10 materials provided on OSHA’s website. One was the online program, CareerSafe, the largest provider of online OSHA 10-hour courses by volume (see Resources). This program also provides supplemental teaching materials for participating teachers. The other program mentioned by several instructors was the Basic Safety unit of the *Core Curriculum—Introductory Crafts Skills* of the National Center for Construction Education Research (NCCER). This unit, intended to be taught over a 12.5-hour period, is designed to meet OSHA 10 requirements and is approved for that purpose by the OSHA Training Institute (OTI) if the instructor is OSHA-approved to teach the OSHA 10. Some instructors also use the NCCER materials, without offering an OSHA 10 card.

What This Looks Like

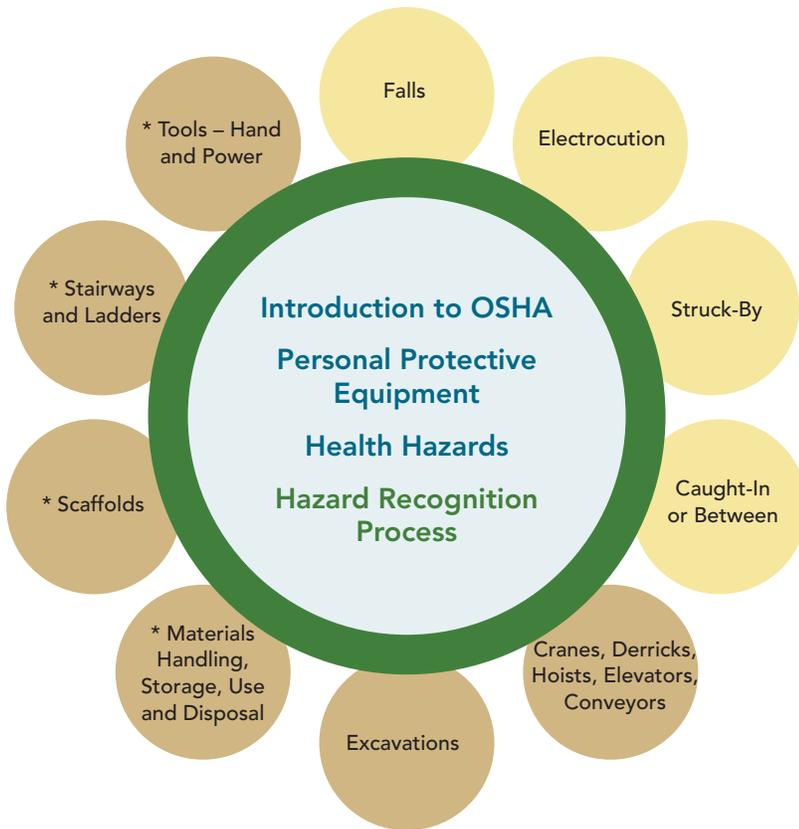
- Where possible, instructors are authorized trainers who can integrate the OSHA 10 content into their trade skills courses. Students end up with an OSHA 10 card.
- OSHA 10 content is taught as it is relevant in the course, with foundational skills up front, and then connected directly to skills students will need.
- OSHA 10 content is taught over a period of at least 12 hours, ideally more.
- OSHA 10 content is taught using effective teaching methods that are participatory and skill-building.



Why the OSHA 10?

The OSHA 10-Hour Outreach Training Program for Construction is intended for entry-level construction workers to develop a safety mindset and learn valuable skills for their future. Construction is a high hazard industry and in 2015, nearly 64.2% of all construction site workplace fatalities were related to OSHA's Construction Focus Four: falls, caught in/between, struck-by, and electrocution hazards. All OSHA-Authorized Outreach training courses, including the OSHA 10, cover these hazards. Incorporating the OSHA 10 into your program can also increase your students' employability, giving them a competitive advantage in the job market. At least seven states now have laws that require construction workers to complete the OSHA 10 before they can work on certain construction projects, and many employers now require an OSHA 10 wallet card regardless.

Operationalizing the OSHA 10-Hour Construction Safety Outreach Training 12+ Hours to Prepare Construction Students for Industry



Mandatory Topics

Introduction to OSHA – 2 hours
 Personal Protective Equipment – .5 hours
 Health Hazards – .5 hours

Hazard Recognition Process

3 hours

Focus Four Hazards

Falls – minimum 1.5 hours
 Others – minimum .5 hours
 4 hours total

Elective Topics

* 2 hours; minimum 2 topics

Credit: Andrew Wermes, Consultant for Skilled & Technical Sciences, Iowa Department of Education



What One School Does: Integrating OSHA 10 into Intro Classes

“In our trade technical college, we embed OSHA 10 in the beginning carpentry class. The instructor is an authorized OSHA Outreach Trainer. The 10-hour class is taught in the context of the class. Students participate in demonstrations of how these principles are practiced in the field. All students who progress through the program receive an OSHA 10 card.”

–Instructor

How CTE Construction Programs are doing

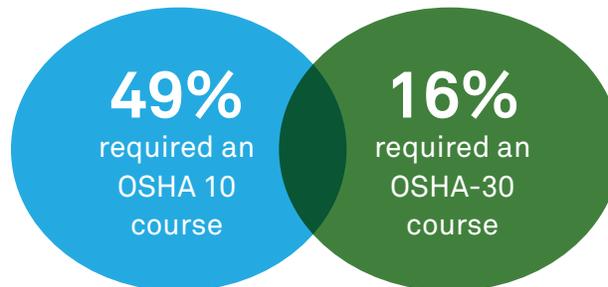
Many CTE Construction programs need to add OSHA 10 training to their curricula and improve its integration into trade skills courses.

About half of all diploma, certificate, or degree programs require students to complete either an OSHA 10 or an OSHA 30 course as part of their program. Very few of the instructors who completed our survey were authorized OSHA trainers (see Section 2B), and only some of those reported integrating the OSHA 10 into a trade skills course.

While a small number (6%) of administrators reported that students take the OSHA 10 training online, most students appear to be getting the training through live instruction—either in stand-alone classes or integrated into a trade skills class. Instructors who teach the OSHA 10 reported spending more than 10 hours on the content (15-22 hours). They also all used a broad variety of effective, hands-on activities when teaching the OSHA 10, including collaborative activities and demonstrations.

9% of instructors reported they were authorized OSHA Outreach Trainers who integrate the OSHA 10 into their trade skills courses.

55% of programs required an OSHA 10 and/or OSHA 30 course.

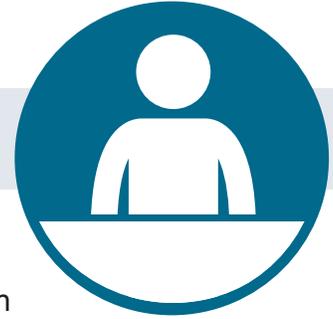


37% of instructors are involved in OSHA 10 instruction in some way.



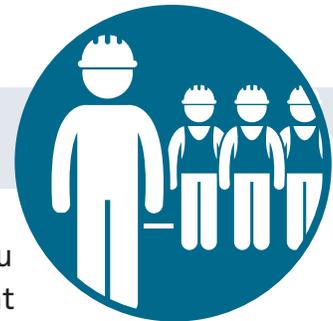
- Authorized trainer (18%)
- Instructional support for students taking the course online (13%)
- Covering the content, even though students don't receive an OSHA 10 card (8%)

Administrators



- Integrate OSHA 10 training into the construction program requirements, so that all students have an OSHA 10 card upon completion of a certificate or degree program:
 - BEST CASE: All or some instructors attend training to become authorized OSHA outreach trainers. Have them teach the content integrated into beginning trades skills classes, covering foundational information up front, and work process-related OSH skills as those skills are taught. (See Section 2B.)
 - <https://www.osha.gov/dte/outreach/construction/index.html>
 - <https://www.osha.gov/dte/outreach/authorized.html>
 - INTERMEDIATE SOLUTION: If students attend a stand-alone OSHA 10 class, make sure trades skills instructors know and understand the OSHA 10 content and review relevant OSHA 10 content during trade skills classes.
- Ensure that OSHA 10 content is taught using effective teaching methods (see Section 3C), and that at least 12 hours of instructional time is available, ideally spread over multiple days.

Instructors



- If students attend a stand-alone OSHA 10 class, make sure you know and understand the OSHA 10 content and review relevant OSHA 10 content during trade skills classes. Be sure to teach all OSHA safety requirements relevant to specific work processes.
- If you are an authorized OSHA trainer, build in adequate time (12 hours or more) to teach the OSHA 10 content using effective teaching methods (see Section 3C), ideally spread over multiple days.



Safety and Health Skills are Taught Effectively and Classroom Reflects Safety & Health Management System

CTE CONSTRUCTION SAFETY AND HEALTH INSTRUCTION should include the most effective approaches and teaching methods, with clear systems for assessing what students are learning. Research shows that OSH training that is participatory and practice-based is more effective than passive methods, such as the use of lectures and slides. At the same time, classrooms should reflect SHMS program elements, both to help develop students' understanding and expectations about what working within an effective safety and health system feels like, and to help ensure safety in the classroom.

What This Looks Like

- Safety and health is NOT considered a stand-alone topic; it is integrated into every course, and is part of every trade skill that students learn and are assessed on.
- All safety and health content goes beyond meeting requirements and is taught in a way that students are prepared to use the information. The core competencies (listed at the beginning of this section) are skills—so students need to use them and practice them.

“We talk about it the first day of class. You have to report all injuries immediately. Then we talk about why we do that: a cut in here that seems like nothing, two days later it’s infected. So we go ahead and do an injury report. We go over that the first day, antibiotic and Band-Aid or whatever and turn the report in. My whole spiel is I’m not going to yell at you, you’re not going to get in trouble for not using the machine properly, it’s more for your safety.”

–Instructor

“One of the ways that you teach adaptability is maybe to ask them to think about what kinds of things can go wrong with this tool.

Exercises for that— ... students need to learn to be cautious and learn to think before acting. Do a mini JSA on what you’re about to do. That means learning how to question this exercise before you start. What can go wrong with this tool. Adaptability and how you teach it is to actually look at the job before they just jump in.”

–Instructor

- In particular, Job Hazard Analysis (JHA) is taught and practiced by students. Using JHAs develops students’ skills in identifying hazards, thinking about controls that need to be in place, and problem-solving to make sure they have everything they need to conduct a task safely.
 - Instructional methods that are participatory and skill building are prioritized, such as hands-on practice.
- The classroom reflects the same SHMS elements that are required on the jobsite, especially those highlighted in Section 1:
- The instructor and CTE program administration demonstrate a clear commitment to creating a safe working environment for students, and enforce safe work practices and encourage active communication about safety and health.
 - Regular safety and health inspections that involve students.
 - An active reporting system for students to help identify potential hazards, near misses, and injuries if they occur.
 - Hazards that get reported are addressed, and students receive information about what was done.



What One Instructor Does: Using the NIOSH Safety Checklist Program for Schools

“I use [the checklist] to teach students about regulations, inspections, etc. I use it as a regular part of teaching hazard recognition – by breaking the safety checklists into inspection areas, dividing students into teams, and having them involved in inspections, around once a week. I alter conditions and equipment, so that can find the hazards I know are there.”

–Instructor



Involving Students in Classroom SHMS

Some of the ways instructors involve students:

- Conducting inspections
- Participating in incident investigations
- Conducting Job Hazard Analyses
- Planning and conducting safety talks/tailgate training
- Serving as the “competent person” for the day

“Students are engaged in inspections, reporting hazards. The students see a lot of stuff that you as an instructor miss. ... I put them in groups of five with a clipboard. I give them each a shop to go to and find hazards and boy do they come back with some sizeable stuff.”

–Instructor

“You get grade reduction. He’s got a chart on safety—if you’re not wearing your glasses. Another thing is you got the lockout-tag out for the motors in there. So if you don’t have that on there, that’s a point reduction.”

–Student



Conducting a Job Hazard Analysis (JHA)

Job Hazard Analysis		
Job:		
Date:	Analysis by:	Approved by:
Job Steps or Sequence	Potential Hazards	Recommended Safe Procedures
1.	1.	1.
2.	2.	2.
3.	3.	3.
4.	4.	4.
5.	5.	5.
6.	6.	6.

Students need to understand how to do job hazard analysis (JHA), also called job safety analysis (JSA), to develop the skill and habit of analyzing the job tasks they are going to do ahead of time, to ensure that the job is set up in the safest way possible. Steps in the process:

1. What are all the steps involved in the job?
2. What are the potential hazards with each step?
3. How can those hazards be mitigated? Think about the hierarchy of controls – engineering controls, management controls, PPE.

Two Instructors Talk About How They Use JHAs:

“I start with an example I’ve written out—cutting wood on a table saw. I discuss the JHA process, and provide students with a JHA template – so they can work through the initial example. From there, students regularly perform JHA’s throughout the course.”

–Instructor

“Students are required just for that intro level course to develop a personal JHA just for what it is that they are going to do. They kind of go through the steps mentally and on paper and list some of the different safety concerns. For instance, if you’re doing some oxy fuel cutting, some of the things that you need to look out for are your hoses, make sure that your water pressure is set correctly, make sure that there are no flammables in the area and things like that. Just be able to plan out your job scope and see some of the different hazards that exist...”

– Instructor

How CTE Construction Programs are doing

A majority of instructors reported integrating OSH education into at least some of their trade skills courses.

Just over three-fourths of instructors reported covering common hazards up front, then providing more safety and health information throughout the course. Instructors use a broad range of teaching methods—most commonly sharing personal stories, hands-on practice, demonstrations, and lectures/PowerPoints. They were least likely to use other participatory methods such as having students give presentations or teach, or using instructional games.

Instructors need to spend more time teaching OSH critical thinking skills.

Instructors reported spending more time on teaching students about safety procedures and using proper PPE than they did on more upstream solutions to safety problems and the critical thinking skills needed to apply them, such as how to conduct a job hazard analysis or understanding the engineering and administrative controls that employers should have in place.

More programs need to engage students in SHMS practices in the classroom, including regular inspections, reporting and investigating hazards, and exposing them to industry practices for ensuring compliance with safety rules.

A third of instructors reported that students were involved in regular inspections of program classrooms and facilities, and 29% reported student involvement in investigations of student-reported hazards or injuries. Only 50% of instructors report using discipline (such as being written up or suspended) for failure to follow safety and health rules, which would more accurately reflect what would happen in a safety-conscious industry setting.

FROM OUR RESEARCH

32% of instructors NEVER cover engineering and administrative controls employers should have in place.

27% of instructors NEVER taught JHAs; Only 1 in 3 spent at least an hour teaching about JHAs.

31% of instructors NEVER covered workers' rights under OSHA.

Instructors were most likely to cover (at least an hour during typical trade skills class)



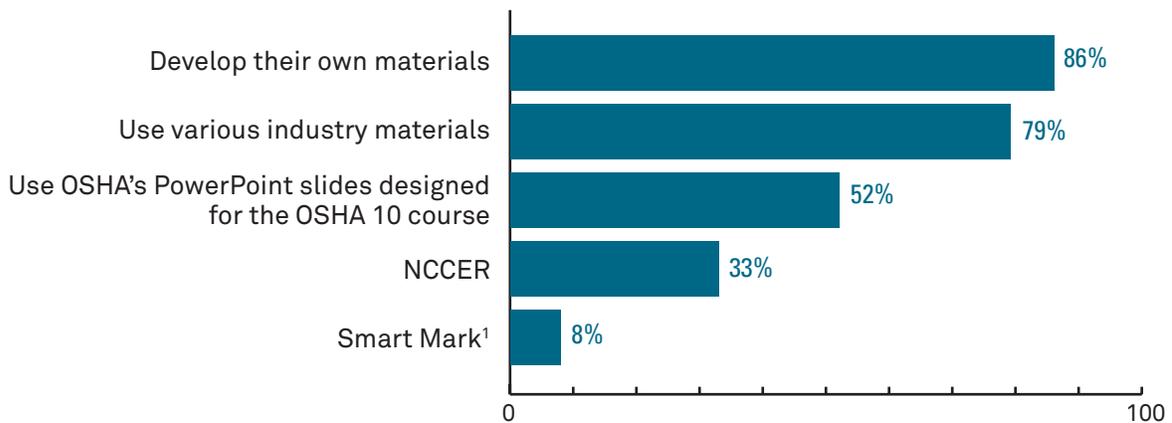
- How to communicate with co-workers/supervisors (58%)
- Using proper PPE (55%)
- The value of safety (50%)

Instructors most frequently had students practice these skills (at least an hour during typical trade skills class)



- Using safety procedures (82%)
- Identifying and fitting proper PPE (69%)
- Communicating with co-worker about safety and health (63%)

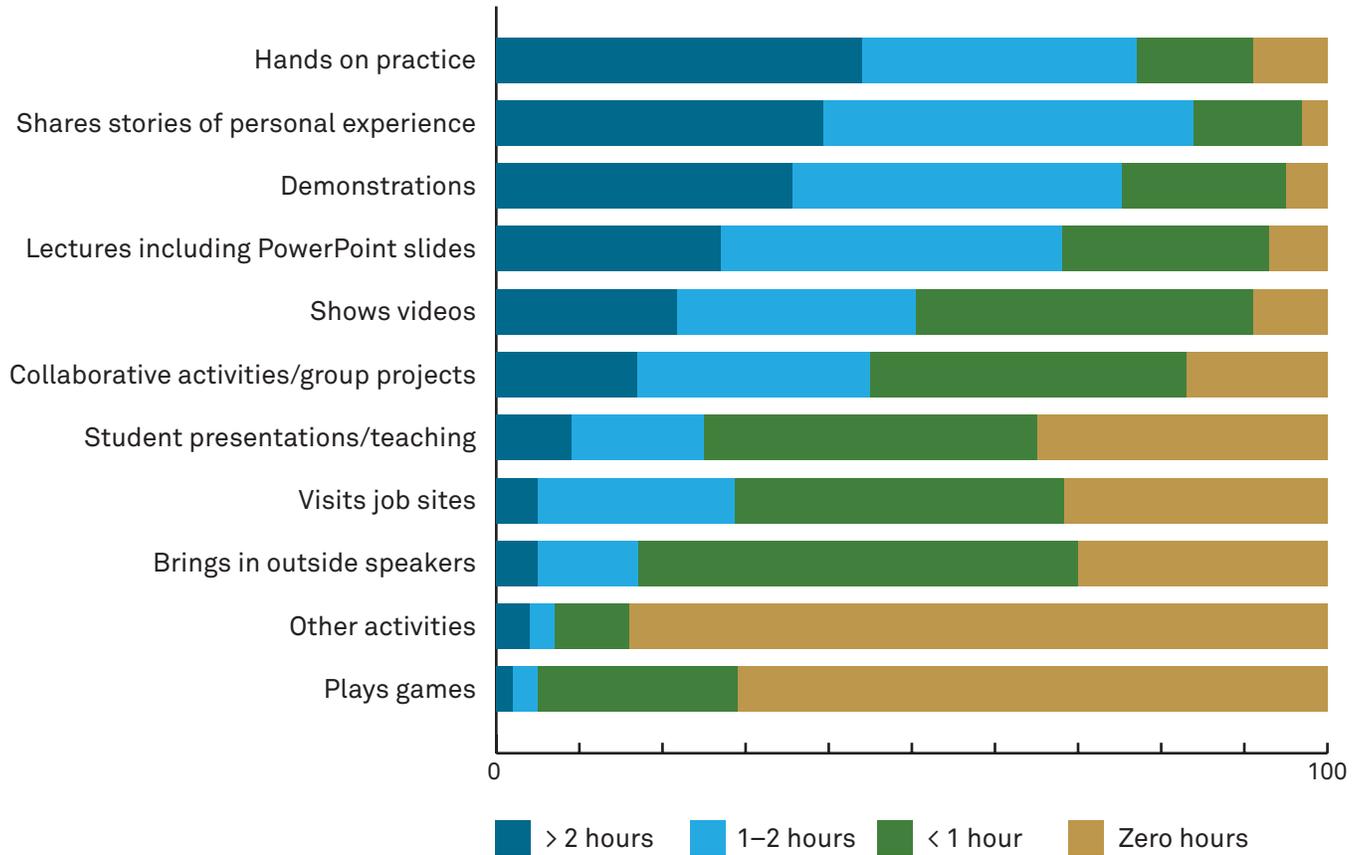
Instructor Reported Materials Used to Teach Safety and Health in Trade Courses



¹ Smart Mark curriculum materials are only available to building trades union instructors. Because this study excluded training programs longer than 2 years, instructors involved only in labor-management apprenticeship programs would not have been included.

FROM OUR RESEARCH

Activities Instructors Used When Integrating OSH into Their Trade Courses



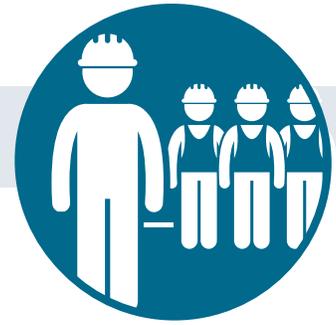
Administrators



- Evaluate faculty on OSH instruction. (See Section 2B.)
- Create opportunities for instructors to share lesson plans, teaching materials, and other strategies for creating a safe learning environment. For example, make this a focus of an instructor meeting each year in which instructors bring and share teaching tools they use to infuse safety and health in all their activities.
- Provide paid time for instructors to seek out new teaching materials.



Instructors



- Review course syllabi and lesson plans and assess the mix of OSH topics (critical thinking skills, the hierarchy of controls, JHAs) covered, the amount of time devoted to topics, and the teaching methods used.
- Make sure OSH learning objectives are clearly defined, and that assessment activities include students demonstrating mastery of these OSH competencies (such as hands-on safety assessments).
- Use Job Hazard Analysis in classroom teaching.
 - [Job Hazard Analysis brochure \(OSHA\)](#)
 - [Tools and Techniques for Job Hazard Analysis \(Oregon OSHA\)](#)
 - [Hierarchy of Controls \(NIOSH\)](#)
- Seek out new, innovative ideas and materials to more effectively teach critical thinking skills. See [Resource List](#) for a place to start.
 - [Online Hazard Identification Training Tool \(OSHA\)](#)
- Collect real-world examples of good and bad practices from the IAC to share as “stories from the field” in the classroom.
- Make sure the classroom reflects SHMS recommended practices:
 - Regular inspections that involve students
 - An active reporting system for students to help identify potential hazards, near misses, and injuries if they occur
 - Students involved in incident investigations
 - Hazards that get reported are addressed, and students hear about the results

Students Learn Self-Advocacy and Problem-Solving Skills for the Workplace

“Construction sites are hazard-riddled so [students] need to recognize those hazards and ... if they do recognize something they gotta raise the question to speak your mind and think for yourself, to raise the questions to whoever. We’re talking about people entering [the field], so they’re gonna have people above them and they need to know that it is okay to raise those questions because the idea is to make it home every night.”

–Instructor

THE REALITY IS THAT THE SAFE PRACTICES THAT students learn in their coursework may not be followed out in the field, especially when working for small, less well-resourced contractors in residential construction, which has the highest rates of injuries in the industry. Yet students are not typically trained or prepared to negotiate safer conditions in these situations.

Students need to understand what their rights and protections are, how to use those protections, and how to strategize and communicate effectively to advocate for safety. These critical thinking, problem-solving, and communication skills in OSH are important employability skills. Employers, especially on a construction site, need employees who are able to identify hazards, understand how to address them, and advocate effectively to prevent their own or others’ injury on the jobsite. These skills need to be taught in CTE construction programs.

Meeting Your School’s Communication ILO

Many schools have institutional or school-wide learning outcomes (ILO) that include communication. One school’s ILO: “The student will demonstrate proficiency in communication skills, including active listening, textual interpretation and comprehension, and oral and written expression.” Developing communication skills in your shop can help meet these learning outcomes.

What This Looks Like

- A classroom that reflects a commitment to the “employee involvement” aspect of SHMS. There is an overall environment as well as specific structures in place (such as student involvement in regular inspections or students leading toolbox talks) that facilitate student communication about safety and health issues. Students know they are expected to speak up about issues.
- Classroom activities will include opportunities specifically designed for students to practice problem-solving and bringing up issues with supervisors or co-workers.



“My assessments – a lot are done in groups. We’ll have teams and we’ll take the class and lock them into teams and that’s how they’ll do their work. Whether it’s hands on, practical exams, studies, oral reports - it’s all done as a team. Each one has to rotate through as a team leader. So they get those soft skills of being able to talk to people and being able to present to the class. Each one has to present to the class, so they’re getting those skills as well as the leadership roles.”

–Instructor

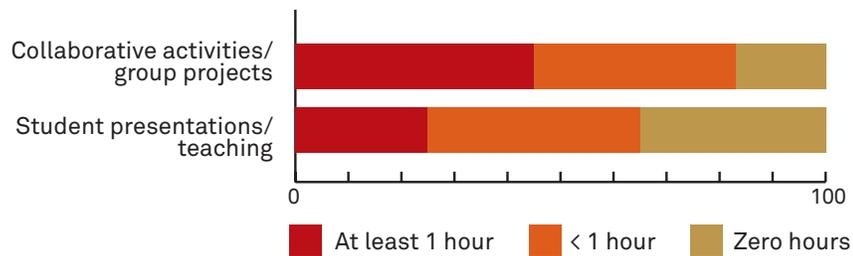
How CTE Construction Programs are doing

In many programs, instructors need to spend more time teaching and having students practice OSH-focused problem-solving and communication skills.

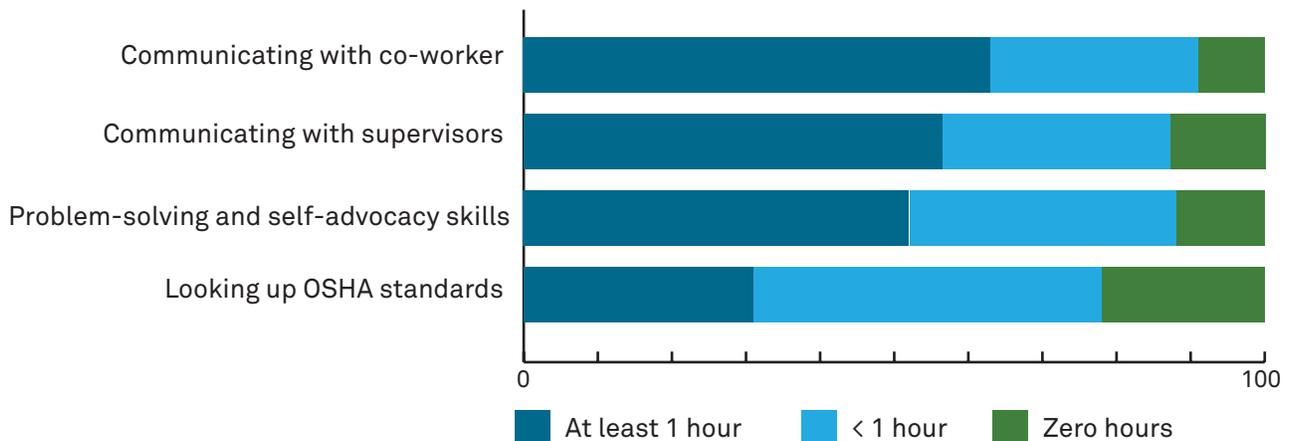
In the survey, over half of instructors reported that students spend an hour or more practicing some of these communication skills in class, although fewer instructors reported actively teaching on these topics. Furthermore, from additional interviews conducted with instructors as part of the study, there was a notable gap reported in materials to help instructors teach these skills, especially for addressing on-the-job safety and health problems with supervisors or employers. Instructors interviewed acknowledged the importance of these skills, but most did not have specific activities they used to teach them.

48% of instructors spent at least an hour teaching about how to communicate with co-workers/supervisors.

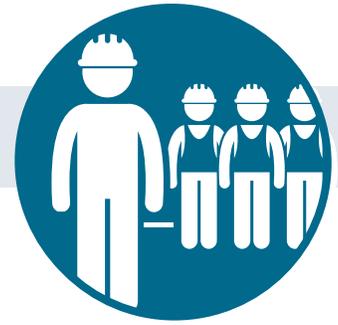
What activities do instructors use that support development of communication and problem-solving skills?



How much time do students spend practicing OSH problem-solving and communication skills?



Instructors



- Make sure communication and self-advocacy learning objectives are included in trade skills classes. Spend enough time teaching these skills, including opportunities to practice them, for students to develop the skills they need.
- Work with other instructors to share and develop specific activities designed for students to practice problem-solving and bringing up safety and health issues with supervisors or co-workers.





KOPF LAKES
CONSTRUCTION

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100%

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Offsite Learning: Safety and Health Program Practices

4

STUDENTS NEED TO PRACTICE THE SKILLS THEY WILL need on the jobsite. Doing this in a well-supervised, real construction environment is a very effective way to provide this opportunity. While some schools require internships or other kinds of field experience, others create this opportunity for “real world” learning by participating in Habitat for Humanity or other community building projects, or construct buildings or parts of buildings on site. In all of these types of field experience, all the elements of an effective Safety and Health Management System must be in place. This section focuses on systems for off-site learning where others outside of the CTE construction program are supervising the students.

“In our program, students do a summer internship. At end of summer, I call the employer. One question I always ask is, are my students safety conscious—are they aware of their surroundings, do they know what the hazards are and what they should do to avoid them. I always get good info. On my last round, several employers told me the student was probably better at it than they were—which they appreciated!”

–Instructor

Offsite Learning Experiences Reflect an Effective Safety and Health Management System

“We’re trying to educate students that protecting workers is the responsibility of the contractor, the employer. Because when they’re going through their internships, they’re often seeing contradictions—a lack of compliance still...For example, in our program it’s the first time they’ve heard that when you work over 6 feet off the ground, you need some kind of fall protection—it’s not what they see at work. All we can do is tell them the future looks different than the past.”

–Instructor

WHEN STUDENTS ARE PRACTICING THEIR SKILLS IN THE real world through an internship or other field experience through your program, that experience needs to reflect the same high industry SHMS practices as your program.

What This Looks Like

- The program has a supervised real-world construction experience requirement.
- The supervised real-world construction experience reflects an effective Safety and Health Management System. This includes ensuring the use of safe work practices on site, effective supervision of students, and an environment where students are encouraged to communicate, ask questions, and speak up.
- The program has a written policy and active process for ensuring that off-campus worksites involved in paid and unpaid training experiences provide evidence that they have an effective Safety and Health Management System in place. The program’s process should include:
 - Required site visits by instructors
 - Written agreements regarding safety training and protections
 - Tools to structure assessment of OSH program components
 - Procedures if the site is determined to have inadequate safety procedures

How CTE Construction Programs are doing

Almost half of programs that offer an Associate’s Degree require students to complete an internship, but fewer than 20% of all other 6-month to 2-year certificate programs required an internship.

Setting up internships requires resources and active industry engagement. As noted above, many programs that do not require internships do provide other kinds of real-world construction experience, supervised directly by the instructors.

Among programs that require students to complete an internship, systems to ensure that the internship sites employ safety and health practices need to be strengthened.

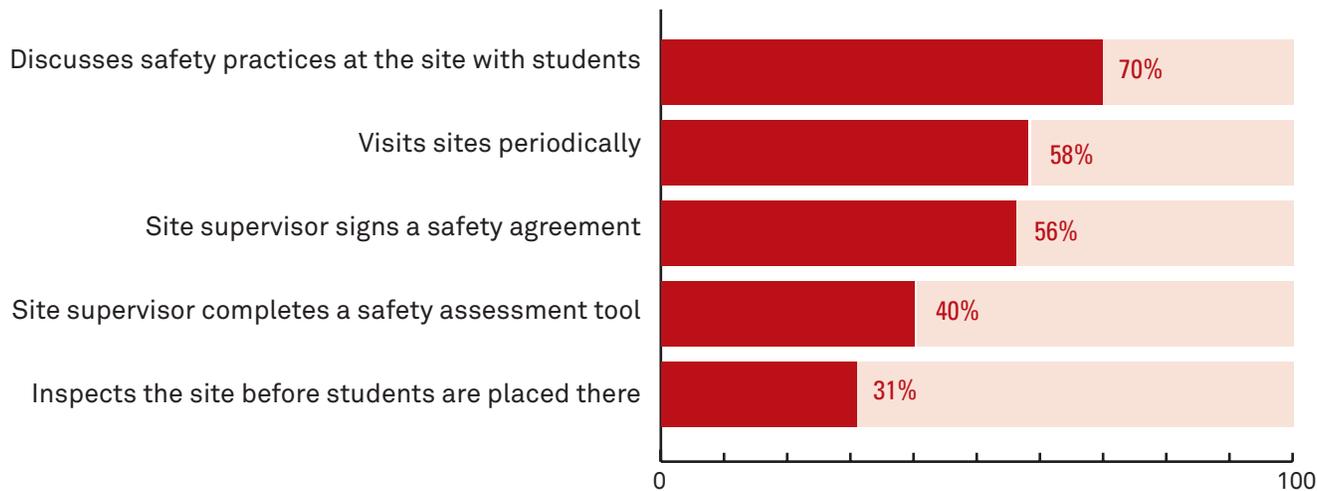
Two thirds of administrators reported having these systems in place, although one quarter did not know whether their programs had these systems. The actions administrators reported they were most likely to take to ensure safe practices included making sure there was someone on the site with the responsibility and credentials to ensure a safe workplace, inspecting the site before students are placed there, ensuring there is an adequate written safety program on site, and visiting the site periodically.

Actions administrators are very likely to take to ensure student safety on internship sites

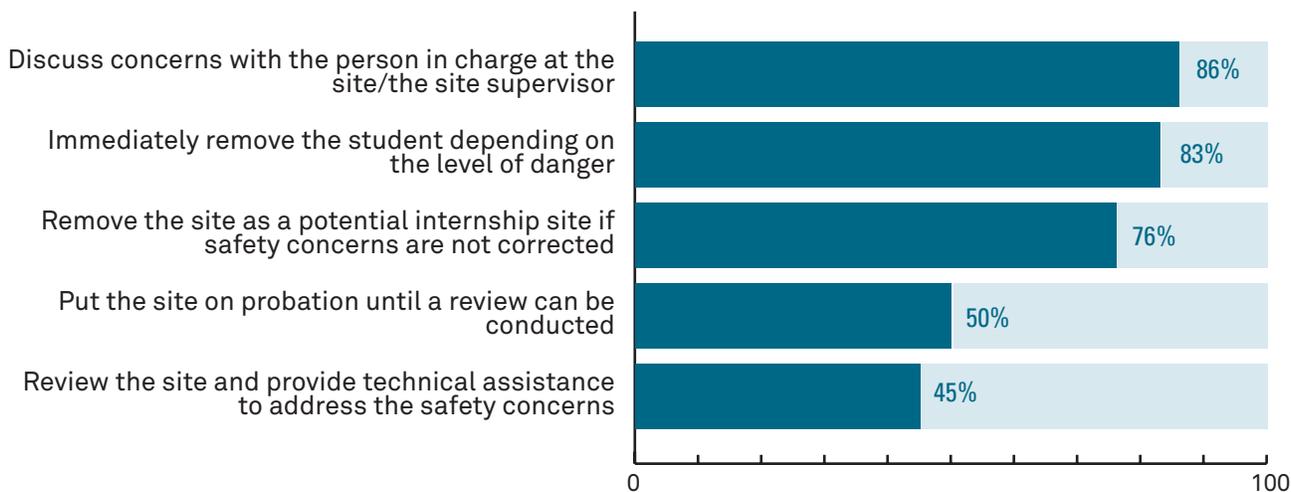


FROM OUR RESEARCH

Actions instructors are very likely to take to ensure student safety on internship sites



Actions administrators are very likely to take if internship site is found to be unsafe

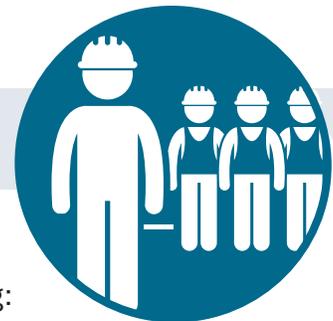


Administrators



- If programs do not currently require internships, explore development of an internship requirement, especially for longer programs.
- If programs require internships, review or develop the written policies to ensure a safe work environment. Make sure policies include the following:
 - Safety agreement, to include:
 - Verification that there is someone on the site with the responsibility and credentials to ensure a safe workplace
 - Verification of written safety programs (SHMS) on site that reflect strong, current industry standards
 - At least one site visit by an instructor in charge before placing the student, and one during the placement, to ensure a safe learning environment
 - Procedures to follow if the off-campus site is found to have inadequate safety procedures

Instructors



- If supervising paid or unpaid internships or other field experience affiliated with the program, make sure policies include the following:
 - Safety agreement, to include:
 - Verification that there is someone on the site with the responsibility and credentials to ensure a safe workplace
 - Verification of written safety programs (SHMS) on site that reflect strong, current industry standards
 - At least one site visit by an instructor in charge before placing the student, and one during the placement, to ensure a safe learning environment
 - Procedures to follow if the off-campus site is found to have inadequate safety procedures
- Have students complete routine job logs that include a question about safety challenges they have faced, and how they met those challenges.



About the Study

This publication highlights findings from multiple research activities conducted in 2015-2016—initial focus groups conducted with 12 instructors and administrators from CTE construction programs; separate surveys conducted with instructors and administrators from across the country, and structured sited visits conducted at three community colleges. It also draws from and expands upon [previous research](#) conducted by the Labor Occupational Health Program that involved interviews with 27 key informants, including instructors, administrators and leadership in CTE construction programs and organizations, as well as safety and health professionals with experience working with CTE programs in construction.

The survey results shared in this document reflect the findings of two surveys conducted within post-secondary CTE construction-related programs across the US. One survey was conducted with administrators (e.g., Deans, Chairs) who oversee these programs and one was with instructors who teach in these programs. To be eligible to participate, schools had to be 2-year public institutions that offer 6-month diplomas, 1 or 2 year certificates or diplomas, or Associates degrees in the construction trades. In total, we collected 71 administrator surveys and 201 instructor surveys across 63 schools. Instructors who participated in the survey were both full-time (72%) and part-time (28%), averaged 12 years of teaching experience, and 23 years of field experience in their trade.

The structured site visits took place in Colorado, Iowa and California. At each site, we interviewed the administrator over CTE construction programs, 2-7 instructors, and 4 students, for a total of 30 interviews. We also conducted 2 classroom observations at each site.

The research was conducted by researchers at the University of California's Labor Occupational Health Program and West Virginia University's Injury Control Research Center, with help from project partners including the National Council on Workforce Education (NCWE) and the Association for Career and Technical Education (ACTE). All study activities were funded by CPWR--the Center for Construction Research and Training, made possible by a cooperative agreement with National Institute for Occupational Safety and Health.



Resources

Resources from the Guidance Document

1. School & Program – Safety and Health Management System (SHMS)

A. Management Leadership

- Recommended Practices for Safety & Health Programs in Construction (OSHA)
https://www.osha.gov/shpguidelines/docs/8524_OSHA_Construction_Guidelines_R4.pdf
The OSHA guide comprehensively describes core elements essential to an effective Safety & Health Program, and provides the framework for the recommendations in this guidance document. CTE construction programs that reflect these core program elements will keep their students safe at school and expose them to the highest industry standard in safety and health protections.
- Injury and Illness Prevention Program eTool for Construction Work (Cal/OSHA Consultation)
<https://www.dir.ca.gov/dosh/etools/09-031/construction.htm>
This etool will help programs to get started on their Injury and Illness Prevention Program (referred to in this guidance document as the Safety and Health Management System), or to review the plan they have in place.
- Injury and Illness Prevention Programs White Paper (OSHA)
<https://www.osha.gov/dsg/InjuryIllnessPreventionProgramsWhitePaper.html>
This website lists states that require a written safety and health program.
- State Plans Frequently Asked Questions (OSHA)
<https://www.osha.gov/dcsp/osp/index.html>
This FAQ reviews OSHA-approved State Plans. After reviewing this site check with your state OSHA program for specific requirements related to your state.

B. Regular Inspections to Identify Hazards

- Noise Exposure Resources
 - Hazard Alert: Noise (CPWR)
http://www.cpwr.com/sites/default/files/publications/Noise_2013_1.pdf
 - Noise, Radiation, and Other Exposures for Construction Self-Inspection Checklist (NIOSH)
<https://www.cdc.gov/niosh/docs/2004-101/chklists/r1n69c~1.htm>
 - Buy Quiet Program (NIOSH)
<https://www.cdc.gov/niosh/topics/buyquiet/posters.html>
 - Sound Level Meter App (NIOSH)
<https://www.cdc.gov/niosh/topics/noise/app.html>

- Noise & Hearing Loss Prevention Webpage (NIOSH)
<https://www.cdc.gov/niosh/topics/noise/default.html>
- Welding Fumes Resources
 - Hazard Alert: Welding Fumes and Gases (CPWR)
http://www.cpwr.com/sites/default/files/publications/Fumes_and_Gases_web-post_0.pdf
 - Welding, Cutting, and Brazing General Requirements Self-Inspection Checklist (NIOSH)
<https://www.cdc.gov/niosh/docs/2004-101/chklists/r1n64w~1.htm>
- Compiled Ergonomic Guides & Checklists (CPWR)
<http://www.cpwr.com/research/ergonomics-guides-checklists>
A resource list of various ergonomics guides and checklists compiled by CPWR.
- Safety Checklist Program for Schools (NIOSH)
<https://www.cdc.gov/niosh/docs/2004-101/default.html>
This Safety Checklist Program can help schools and programs get into compliance even when they have little safety and health experience, a busy schedule, and many unanswered questions.
- Safety Checklist Program for Schools -Chapter 4: Safety Checklists and Indexes (NIOSH)
<https://www.cdc.gov/niosh/docs/2004-101/chap4.html>
Chapter 4 of the Safety Checklist Program provides information via checklists and indexes that can help schools and programs get into compliance, specifically one for the construction trades.

C. An Active Reporting System to Identify Hazards

- eTool Identified Hazards and Correction Record Sample Form (Cal/OSHA Consultation)
<https://www.dir.ca.gov/dosh/etools/09-031/IndHazCorRec.pdf>
A web-based form that can be completed by anyone to report safety and health issues, including hazards as well as close calls/near misses.

D. All Injuries, Incidents, and Near Misses are Investigated to Identify Underlying Hazards

- Incident [Accident] Investigations: A Guide for Employers (OSHA)
https://www.osha.gov/dte/IncInvGuide4Empl_Dec2015.pdf
The purpose of this Incident Investigation Guide is to provide employers a systems approach to help them identify and control the underlying or root causes of all incidents in order to prevent their recurrence.
- How to Conduct an Incident Investigation (National Safety Council)
<http://www.nsc.org/JSEWorkplaceDocuments/How-To-Conduct-An-Incident-Investigation.pdf>
The document describes steps in an incident investigation process, including what to document.

- Investigation of Accidents, Injuries and Illnesses Tool (Labor Occupational Health Program)
http://lohp.org/wp-content/uploads/2013/12/Tools_1_Investigation_of_Accidents-1030.pdf

An incident investigation form that helps identify root causes of accidents, injuries and illnesses, and to prevent similar events from happening in the future.

E. Hazards are Controlled Effectively to Prevent Injuries

- Insurance Loss Control Specialists (EMC Insurance)
<http://www.emcins.com/losscontrol/industries/schools.aspx>

A resource list of loss control resources for schools including online trainings, safety talks, posters manuals and more.

- On-site Consultation Program (OSHA)
<https://www.osha.gov/dcsp/smallbusiness/consult.html>

OSHA's On-site Consultation Program offers free and confidential safety and occupational health advice to small and medium-sized businesses in all states across the country, with priority given to high-hazard worksites. On-site Consultation services are separate from enforcement and do not result in penalties or citations. Consultants from state agencies or universities work with employers to identify workplace hazards, provide advice on compliance with OSHA standards, and assist in establishing injury and illness prevention programs.

2. Instructor Qualifications and Support

A. Instructor Field Experience

- ApprenticeshipUSA Toolkit: Build (U.S. Department of Labor)
<https://www.dol.gov/apprenticeship/toolkit/models-build.htm>

The tools in this toolkit include an overview of partnership models and resources to build these partnerships.

- Appendix A: Work Process Schedule, Carpenter (U.S. Department of Labor)
https://www.doleta.gov/OA/pdf/APPENDIX_A_CARPENTER.pdf

This U.S. Department of Labor carpentry apprenticeship schedule shows the range of skills needed for the carpentry trade. It is one type of resource programs can use update program requirements for instructor experience.

B. Training and Support to be Effective Instructors

- Framework for 21st Century Learning (Partnership for 21st Century Learning)
<http://www.p21.org/our-work/p21-framework>

P21's Framework for 21st Century Learning was developed with input from teachers, education experts, and business leaders to define and illustrate the skills and knowledge students need to succeed in work, life and citizenship, as well as the support systems necessary for 21st century learning outcomes.

- CTE Teacher Coaching and Support (CAROCP: The Association of Career and College Readiness Organizations)
http://www.rocpinspire.org/cte_teachers.asp
The CAROCP webpage highlights California career and college readiness organizations supports CTE teachers.
- High Quality CCTE Certification Program (Association for Skilled and Technical Sciences)
<http://www.astsonline.org/AstsCcteCertifications.asp>
The Association for Skilled and Technical Sciences (ASTS) has developed a High Quality CCTE certification program to meet the need for recognizing life-long achievements of educators in schools, colleges and institutions, including Industry trainers. This certificate is unlike most academic certificates in that it recognizes and rewards individuals for industry related experiences during their career path. These workshops, industry certificates, industry awards, teaching awards, and Trades Association recognitions and awards are not generally recognized by educational institutions.
- Association for Career and Technical Education (ACTE)
<http://www.acteonline.org/>
ACTE is the largest national education association dedicated to the advancement of education that prepares youth and adults for successful careers, with annual national and regional conferences.
- SkillsUSA
<http://www.skillsusa.org/>
SkillsUSA is a partnership of students, teachers and industry working together to ensure America has a skilled workforce. SkillsUSA's mission is to help its members become world-class workers, leaders and responsible American citizens. Serves more than 4000 schools and colleges across a wide range of occupations, including construction (131 occupational specialties/pathways). A Skills University is held every summer for students, with a separate track for instructors.
- Skill Assessment Blueprints for cabinetmaking, carpentry, electrical construction wiring (residential), masonry, plumbing, and welding (among many others not related to construction) can be found here:
<http://www.workforcereadysystem.org/wp-content/uploads/2015/07/TechDraftingTeacherGuide.pdf>
The assessments were created by industry to ensure relevance to entry level skills, meet Perkins IV accountability requirements, and provide credentials to students who achieve industry defined scores.
- CTE Online (Center for the Advancement of Digital Resources in Education)
<https://www.cteonline.org/>
CTE Online is a place for California Educators to explore and access teacher-created curriculum. It also has tools for users to create their own curriculum and collaborate in

groups.

- Continuing Professional Development Plan/Record (ASTS)
<http://www.astsonline.org/documents/ApplicationForms/ASTSProfessionalDevelopmentPlan.doc>

This document is a sample professional development plan/record that includes safety and health teaching skills. CTE Online is a place for California Educators to explore and access teacher-created curriculum. It also has tools for users to create their own curriculum and collaborate in groups.

C. Training and Staying Up to Date in Safety and Health

- Outreach Training Program: OSHA 10 and OSHA 30 (OSHA)
<https://www.osha.gov/dte/outreach/construction/index.html>

The Outreach Training Program provides basic safety and health information and education — it does not fulfill an employer’s requirement to provide training under specific OSHA standards. The OSHA Outreach Training Program for the Construction Industry provides training for workers and employers on the recognition, avoidance, abatement, and prevention of safety and health hazards in workplaces in the construction industry.

- Outreach Training Program: Construction Industry Procedures (OSHA)
https://www.osha.gov/dte/outreach/construction/construction_procedures.pdf

A document that contains information on OSHA’S Outreach Training Program’s Construction Industry Procedures for OSHA 10-Hour and OSHA 30-Hour.

- Training Institute Education Center Locations (OSHA)
<https://www.osha.gov/dte/edcenters/map.html>

A webpage with a map of OSHA’s OTI Education Center Locations.

- How to Become an Authorized Trainer (OSHA)
<https://www.osha.gov/dte/outreach/authorized.html>

An OSHA webpage with information on how to become an OSHA authorized trainer (OSHA Course #500/510 series) in construction and general industry.

D. Support for Engaging Industry Advisory Committees (IACs)

- Program Advisory Committee Handbook (Minnesota State Colleges & Universities)
http://www.mnwest.edu/images/faculty-resources/prog_advisory_handbook.pdf

The Minnesota State Colleges & Universities’ Program Advisory Committee Handbook provides useful guidance for setting up effective IACs.

- [Building Advisory Boards that Matter \(ACTE\)](https://iweb.acteonline.org/Purchase/ProductDetail.aspx?Product_code=BADVISORY)
https://iweb.acteonline.org/Purchase/ProductDetail.aspx?Product_code=BADVISORY

An ACTE publication that will help you develop an effective board for your CTE program. In this book, you will also learn how to effectively engage key stakeholders,

whether they are members of business and industry organizations, community groups, certification or postsecondary programs, parents, students or general citizens.

3. Effective Teaching and Learning

A. Curriculum Content is Up-to-Date and Reflects Core Safety and Health Competencies

- Training Requirements in OSHA Standards (OSHA)

<https://www.osha.gov/Publications/osha2254.pdf>

The publication provides information on what industry work processes require OSHA specific training to ensure that those OSHA training requirements are met, before those processes are carried out.

B. OSHA 10 Training is Included, Well-integrated, and Taught Effectively

- Outreach Training Program: OSHA 10 and OSHA 30 (OSHA)

<https://www.osha.gov/dte/outreach/construction/index.html>

The Outreach Training Program provides basic safety and health information and education — it does not fulfill an employer’s requirement to provide training under specific OSHA standards. The OSHA Outreach Training Program for the Construction Industry provides training for workers and employers on the recognition, avoidance, abatement, and prevention of safety and health hazards in workplaces in the construction industry.

- How to Become an Authorized Trainer (OSHA)

<https://www.osha.gov/dte/outreach/authorized.html>

An OSHA webpage with information on how to become an OSHA authorized trainer in construction (OSHA Course #500/510 series) and the general industry.

C. Safety and Health Skills are Taught Effectively and Classroom Reflects Safety & Health Management System

- Job Hazard Analysis Brochure (OSHA)

<https://www.osha.gov/Publications/osha3071.pdf>

The OSHA brochure explains what a job hazard analysis is and offers guidelines to help you conduct your own step-by-step analysis.

- Tools and Techniques for Job Hazard Analysis (Oregon OSHA)

<http://osha.oregon.gov/OSHAedu/job-hazard-analysis/1-121w.pdf>

The Oregon OSHA document introduces a new approach to conducting JHAs in a way that will help design job procedures that are as safe as possible. It also highlights ways to write effective safe job procedures that may be used as lesson plans for on-the-job training.

- Hierarchy of Controls (NIOSH)
<https://www.cdc.gov/niosh/topics/hierarchy/>
The NIOSH webpage provides a description of the hierarchy of controls.
- Online Hazard Identification Training Tool (OSHA)
<https://www.osha.gov/hazfinder/index.html>
An interactive, online, game-based training tool for small business owners, workers and others interested in learning the core concepts of hazard identification.

General Resources

- About the Safety Checklist for Construction (CPWR)
http://www.cpwr.com/sites/default/files/publications/About_SafetyChecklist_English_web.pdf
This document provides background for the Safety Checklist for Construction, including who should complete the checklist and the purpose of the checklist.
- Construction Safety Checklist (CPWR)
http://www.cpwr.com/sites/default/files/publications/ConstructionSafetyChecklist_English.pdf
This checklist is a tool that can be used to find and record common construction hazards.
- Hazard Assessment Checklist (Cal/OSHA)
<http://www.dir.ca.gov/dosh/etools/09-031/hazassesscheck.pdf>
This checklist can be used to identify and evaluate hazards in your workplace. This checklist covers a wide variety of workplace safety and health hazards.
- Foundations for Safety Leadership (FSL) Training Module (CPWR)
<http://www.cpwr.com/foundations-safety-leadership-fsl>
This webpage provides information on and downloads to the Foundations for Safety Leadership (FSL) training module, which is now an official elective in the OSHA 30-Hour training course.
- Resource for Development and Delivery of Training to Workers (OSHA)
<https://www.osha.gov/Publications/osha3824.pdf>
This OSHA guide outlines information on developing and delivering effective training to workers.
- Best Practices for Development, Delivery, and Evaluation of Susan Harwood Training Grants (OSHA)

<https://www.osha.gov/dte/sharwood/best-practices-booklet.pdf>

This document can assist Susan Harwood grantees in developing, delivering, and evaluating training for workers and employers.

Other Teaching Resources Identified by Instructors

- CareerSafe

<http://www.careersafeonline.com/index.php/component/content/article/9-courses/36-osha-10-hour-construction-industry>

This OSHA-approved online training program for Construction Industry provides training for entry level workers and employers on the recognition, avoidance, abatement, and prevention of safety and health hazards in workplaces in Construction industry. The program also provides information regarding workers' rights, employer responsibilities, and how to file a complaint.

Students who successfully complete the CareerSafe OSHA 10-Hour Construction Industry course receive an OSHA 10-Hour Construction Industry wallet card from the OSHA Training Institute (OTI). The cost for the CareerSafe OSHA 10-Hour Construction Industry Training is \$25 per student. This includes the \$18 training course and the \$7 mandatory OSHA processing fees.

- National Center for Construction Education and Research (NCCER) Core Curriculum

<http://nccer.pearsonconstructionbooks.com/store/browse.aspx?st=69098>

The NCCER Core Curriculum is a prerequisite to all other Level 1 craft curriculum. Its modules cover topics such as Basic Safety, Communication Skills and Introduction to Construction Drawings. Completing this curriculum gives the trainee the basic skills needed to continue education in any craft area he or she chooses. The curriculum complies with OSHA 10-Hour Construction Industry Outreach Training Regulations when taught by an OSHA Authorized Construction Outreach Safety Instructor.

- AFL-CIO Multi-Craft Core Curriculum

<https://nabtu.org/multi-craft-core-curriculum/>

The Building Trades National Standing Committee on Apprenticeship and Training has identified courses in all building trades' apprenticeship programs that are offered in common without regard to a particular craft, a common core curriculum. The courses are: general orientation to apprenticeship; cardiopulmonary resuscitation (CPR) and first aid; the OSHA 10 hour certification course; blueprint reading; applied mathematics for construction applications; history of the construction industry and the heritage of the American worker. The general orientation course includes construction industry structure and the construction process; orientation to apprenticeship itself; tools of the various trades, and industry standards of work responsibility. The total core includes 120 hours of classroom training.

- Youth @ Work: Talking Safety

<http://www.cdc.gov/niosh/talkingsafety/>

Youth@Work: Talking Safety is a foundation curriculum in occupational safety and health developed with OSHA and NIOSH funding by the Labor Occupational Health Program at U. C Berkeley, Education Development Center, Inc. , and includes activities developed by the Occupational Health Surveillance Program of the Massachusetts Department of Public Health. This curriculum is meant to be used in a classroom or other group training setting, and has been customized for each state, Puerto Rico, Washington D. C., and the U. S. Virgin Islands to address their specific child labor rules and regulations. The entire booklet includes instructions for teachers and a step-by-step guide for presenting the material.

- WISC Online

<http://www.wisc-online.com/Category.aspx?ID=40>

(Learning Objects in Technical – Safety) Wisc-Online is a digital library of Web-based learning resources called “learning objects.” The digital library of objects has been developed primarily by faculty from the Wisconsin Technical College System (WTCS) and produced by multimedia technicians who create the learning objects.

- OSHA's 11

<https://osha.washington.edu/pages/yw-curriculum-oshas-11-0>

This curriculum was developed by the Labor Occupational Health Program at U. C. Berkeley, the Education Development Center Inc. , and the OSHA Education Center at the University of Washington to teach OSHA 10-hour general industry course content in a more participatory and youth-oriented way. Contains interactive lessons and activities on foundational skills including hazard identification and control and problem-solving on the job, as well as topic-specific lessons on electrical safety, chemical hazards, bloodborne pathogens, ergonomics and workplace violence.

- Young Worker Safety and Health Training for the Construction Industry

<http://www.youngworker.gatech.edu/online-training-and-training-materials>

These materials—a 1-hour lesson plan, PowerPoint presentation, and short training videos—are designed to provide construction-specific content after students have participated in foundational OSH training activities, based in large part on the Youth@Work--Talking Safety curriculum activities.

- Basics of Occupational Safety 1st Edition by David L. Goetsch, University of West Florida and Okaloosa-Walton, 2009. Provides an up-to-date, practical teaching resource that focuses on the basic safety-related needs of people in the workplace. It is intended for use in universities, colleges, community colleges, and corporate training settings that offer programs, courses, workshops, and seminars in occupational safety and health.

Appendix : Core Occupational Safety and Health Competencies

Review of industry and safety and health education standards and consultation with experts in the field identified the following general Core Occupational Safety and Health Competencies. Competencies that align with OSHA 10/30 objectives are notes with an asterisk.

Curriculum is designed so that by the end of training, students achieve the following OSH competencies. Students will be able to:

- Identify and describe major types of hazards in construction.*
(* required under OSHA 10/30; others are elective choices)
 - Focus four [fall, caught-in or between, struck-by, electrocution]*
 - Health hazards* [noise, silica or any other construction health hazard]
 - Chemical hazards (hazard communication standard)
 - Stairways and ladders*(only OSHA 30)
 - Tools—hand and power
 - Scaffolds
 - Materials handling, storage, use and disposal (lifting, equip, rigging, hazmat storage, disposal)
 - Ergonomics
- Demonstrate an understanding of how employers should set up the work environment and tasks to limit exposure to hazards – hierarchy of controls/ engineering controls/prevention by design.
- Demonstrate ability to protect self and others from the hazards listed above.*
- Conduct a JOB HAZARD ANALYSIS for specific tasks (see list above), which includes:*
 - Identify hazards.

- Describe potential impact of these hazards on worker health and safety: acute injury, cumulative trauma, and short and long term health effects .
 - Describe ways to control the hazards, focused on the hierarchy of controls.
 - Recognize employer requirements to protect workers from the hazards listed above.
- Explain worker rights and employer responsibilities under OSHA.*
 - Explain the impact of injuries and why OSH programs are needed on every job (human suffering of employee, family, co-workers); saves money (productivity, property loss, insurance rates); creates better place to work.
 - Demonstrate/express attitudes that value safety, including taking the impact of injury seriously, believing work-related injury and illness can be prevented, and demonstrating a commitment to safe practices at all times (including not taking short cuts).
 - Explain why OSHA is important to workers (including history of workplace conditions, leading to why OSHA exists).*
 - Discuss the use of OSHA standards and demonstrate ability to find relevant standards and other OSH information, and explain what they mean.*
 - Demonstrate effective communication skills with co-workers and supervisors/instructors.
 - Demonstrate/express confidence in speaking up and advocating for oneself.
 - Choose and demonstrate specific strategies for solving on-the-job problems, including identifying the problem, resources, and potential solutions, as well as integration of communication skills.
 - Describe potential emergencies at work, appropriate emergency preparedness and response procedures, and employer responsibilities regarding emergency preparedness and employee training.
 - Explain/demonstrate what to do in case of injury or harm to themselves or other students, faculty, staff (training in first aid, procedures for contacting first responders, who to report the incident to, etc.).

* = OSHA 10/30 objectives

