The State of Training and Development in Architecture, Engineering, and Construction (AEC)

Introduction

Architecture, engineering, and construction (AEC) firms face constant change. From technological advancements to evolving codes and standards, there is always a need for up-to-date compliance and skills-based training for the AEC workforce.

AEC is also an industry made up of a large variety of licensed professionals. Maintaining licenses and certifications is always top of mind for employers of architects, engineers, tradespeople, and construction project managers.

In this guide, we will take a deep dive into the current state of training in AEC, reviewing the challenges and opportunities of a great learning and development program. And we will review current technology solutions and training content best practices that meet the needs of AEC professionals and employers.

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Architecture, Engineering, and Construction Training Needs

Across the AEC industry, there are a wide variety of training needs. Regardless of role, AEC firms need to provide the following types of training:

1.

Technical Skills

AEC professionals require skill-specific training. This might include design software for design and drafting or training on operating heavy equipment and power tools.

2.

Regulatory Compliance

There are numerous safety regulations, codes, and industry standards that AEC firms must be compliant with. From building codes to OSHA requirements, employees in the AEC industry must comply to remain safe and avoid fines.

3.

Project Management

Effective project management is crucial in the AEC industry. Training in project planning, scheduling, budgeting, and communication is essential for construction project managers and team members.

4.

Health and Safety

Construction sites can be dangerous, so health and safety training is crucial. This includes training on proper equipment usage, hazard identification, and emergency procedures.

5.

Professional Development

AEC professionals benefit from ongoing professional development to stay updated on industry trends, new technologies, and best practices

6.

Soft Skills

As construction projects grow in complexity and size, many skills are needed for project success and operational excellence. While technical skills are critical, soft skills such as communication, teamwork, critical thinking, and collaboration are also vital. Training in these soft skills helps improve overall project efficiency and success.

Given the dynamic nature of the industry and the continuous advancements in technology and construction methods, ongoing training is essential for AEC firms to stay competitive and be successful.

While there are countless other training needs for each sub-industry within AEC, let's review a few of the most important competencies architects, engineers, and construction/tradespeople require.

Architecture Training Needs

- **Technical Proficiency in Design Software.** Architects need specialized training in design software such as CAD and 3D modeling tools to effectively create detailed architectural plans and designs.

- **Building Codes and Regulations.** Architects must undergo regular training to stay updated on local building codes, zoning regulations, and compliance requirements.

- **Sustainability Practices.** Training in sustainable design principles and green building practices (e.g., LEED and WELL) is essential for architects to design environmentally conscious projects.

Engineering Training Needs

- **Engineering Software.** Engineers require training in advanced software tools relevant to their field, such as structural analysis software, finite element analysis (FEA) tools, and computer-aided engineering (CAE) software.

- **Safety Requirements.** Ensuring the safety of structures requires specialized training in risk assessment, hazard identification, and safety engineering principles.

- **Emerging Engineering Technologies.** Ongoing training in emerging technologies, such as artificial intelligence in engineering, is crucial for engineers to stay competitive.

Construction & Trades Training Needs

- **Heavy Equipment Operation.** Construction workers and tradespeople need hands-on training in the safe and effective operation of heavy machinery and equipment on construction sites.

- **Blueprint Reading and Interpretation.** Training in reading and interpreting construction blueprints is essential for tradespeople to understand project specifications and execute tasks accurately.

- **Occupational Safety Training.** Construction workers must undergo comprehensive occupational safety training, covering topics such as fall protection, ladders, electrical safety, and personal protective equipment (PPE) usage.

- **Construction Project Management.** Training in project management is vital for professionals overseeing construction projects. This includes modules on scheduling, budgeting, risk management, and effective communication to ensure successful project delivery.

Why Training AEC Personnel Matters

It's clear that training is important for AEC professionals to be able to complete their jobs effectively and safely. But sometimes we put off improving employee training programs because it takes time and resources.

But do you know the larger impact of a structured training program for your workforce? One where the training materials aren't just there to check a box on a requirement but to truly engage, teach, and develop your workforce?

Studies Show that Thoughtful Training and Development Leads to:

1 **Improved worker skills.** Most skills degrade after just five years without training to reinforce them. That falls to two and a half years for more technical skills[1].

2 **Increased performance and worker productivity.** By giving employees the knowledge and skills they need to do their job confidently and effectively, you directly impact the productivity and output of your workforce. In fact, 80% of employees think that more training will make them more likely to achieve their goals at work[2].

3 **New Hires Ramp Up Faster.** It's no secret that the AEC industry has been struggling with a labor shortage for several years now and that hiring and retention will remain a top challenge in 2024 and beyond. But better onboarding training (like investing in learning paths) speeds up the time it takes new employees to acclimate to their role and start adding value[3].

4 **Lower employee turnover.** 80% of employees feel more satisfied with their jobs because of training[2], which leads to lower turnover. Studies have also found that at companies that don't offer employee training, only 21% of new hires intend to stay there. At companies that do offer training, 62% intend to stay[4].

5 **Improved Company Reputation.** Offering employee training and growth opportunities is a highly sought-after benefit. Growing your reputation as a company that develops its people and invests in continued growth will also make you more competitive and able to attract top talent[3].

Top Training Challenges AEC Firms Face

The architecture, engineering, and construction industry is facing a perfect storm of challenges. The industry is set to grow at a rapid rate, with the rise of megaprojects, infrastructure investment, and continued urbanization. However, AEC is facing a severe labor shortage.

- 55% of architects and engineers say the Great Resignation is still alive and well in the industry and would consider leaving their current employer for a new opportunity[6]. The top reason for quitting? Limited growth opportunities. Only 26% strongly agree they have a path for advancement at their current company.

- About a third of AEC employees are over the age of 55 and set to retire, according to BLS data.

- Diversity, equity, and inclusion (DEI) issues are leading to low participation rates among women in the industry[7].

With demand for AEC professionals at an all-time high, but the supply of qualified professionals being low, competition for talent is steep. AEC firms need strategies to attract, quickly onboard, train, and retain their employees. This makes having a learning and development strategy not just a nice-to-have, but a necessity.

> **"The industry is in the phases of some monumental evolution with many things hitting all within a window of time such as COVID, Supply Chain Issues, Rising Costs, Labor Shortages, Consolidation, and throw in Current Economic Conditions/Relapse. Although this is daunting, we can't become discouraged on needing, now more than ever, to power ahead."**
>
> **Luiza Mills**
> *Senior VP, Interstate Electrical Services Corporation[5]*

Training Challenges in the Industry

So, training is clearly needed. But simply knowing you need continuing education, career paths, and ongoing skills training is one thing. Executing on it is another.

AEC firms are facing a variety of challenges with their L&D programs:

1 **Tight budgets.** Economic and logistics uncertainties will continue into 2024[9]. From rising material costs, inflation, supply chain disruptions, and the increasing cost of labor, budgets for AEC firms are tight. But just because a training platform or improved training content may seem like an expense, the ROI of consolidating training and offering high-quality continued education is positive.

2 **Outdated training materials and methods.** Many companies, especially smaller AEC firms, have been forced to rely on outdated training materials like DVDs and PowerPoints. This content is inherently not very engaging and might even include outdated information.

3 **Limited time.** AEC is facing a talent shortage. This makes it even harder to carve out the time for employee training.

4 **Resistance to change.** Despite huge advancements in technology, the construction industry is historically slow to adopt technology, including training technology. If AEC firms want to get ahead and compete for talent, they will have to differentiate by embracing change and technology that makes their operation more efficient.

89%
of L&D professionals agree that proactively building employee skills **will help navigate the evolving future of work.**[8]

"**What we need to do going forward is... make the organization more resilient by redesigning practices to be better aligned with how we think, work, and learn...**"

— Dr. Clark Quinn, Ph.D.
Executive Director, Quinnovation

The Current State of AEC Training and Development

It's vital for AEC firms to overcome the barriers to training their workforce if they want to retain talent and increase revenue. To do that, it's important to meet employee expectations, embrace technology, and stay current on industry regulations and best practices.

How AEC Professionals Want to Be Trained

Employees want to be invested in. They want to grow their careers. That's true no matter what your role is in the AEC industry.

From there, it's important to understand what employees want out of their training and how they want to learn. A survey of AEC professionals showed that the preferred ways to obtain continuing education credits are[10]:

35% Face-to-face presentations

30% Self-paced online courses

23% Live webinars

12% Printed courses with links to quizzes

What this shows is that people want to learn in a variety of ways (often called blended or hybrid learning). It's important that AEC companies stop relying on one single approach to ongoing employee education.

Advancements in Training Technology

There are numerous technological advancements for AEC professionals. From the rise of artificial intelligence (AI) to using Virtual Reality (VR) for design, the industry is constantly evolving. The way AEC companies train their employees has to evolve, too.

The most successful teams embrace new technology and are willing to innovate to keep employees trained in new technology. Not only will this boost productivity and revenue, but it's also going to be critical for attracting Gen Z talent.

Training technology is evolving to keep pace with the needs of the industry. This includes:
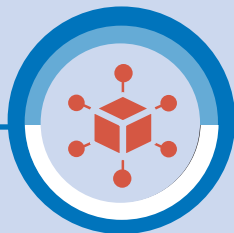
3D animation creates immersive training experiences where employees can see and experience things they normally wouldn't be able to (e.g., the inside of equipment, scenarios).

Video-based branching allows employees to select options to see the impacts of their choices in a safe environment.

Compliance and Regulations

Staying up to date with the latest standards and regulations is no easy task. AEC firms that are creating their own content or having to source all the required content themselves have their work cut out for them.

The sheer amount of compliance training can be overwhelming.

Partnering with a vendor like Vector Solutions can be a great way to ensure all training materials are current and that employees can easily and quickly complete training required to maintain their licenses. This allows in-house learning and development teams to focus more on company-specific training needs, mentoring programs, and other strategic training initiatives.

The Future of AEC Training and Development

No one has a crystal ball to know what's in store for us in the years ahead, but we can try to predict what the future of AEC training and development might be.

Analysts predict an increasing demand for soft skills such as leadership, agility, and resilience, and an intensifying demand for technological skills. In the rapidly evolving AEC sector, new technology plays an especially important role and is one of the greatest factors influencing in-demand skills in the industry.

AEC firms are being forced to reimagine their operations, which calls for building new skills and capabilities in their workforce. Going forward, we're likely to see:

• Increased reliance on digital collaboration tools and a digital classroom to complement online training.

• Using 4D and 5D simulations for planning.

• Investments in AI and other software to increase workforce productivity.

It's clear that organizations need to provide more diverse training to remain competitive in the marketplace.

"The future is still bright! The industry can't stop and won't. Technology, AI, prefabrication, automation, robotics, repurposing of spaces, and energy efficiency will continue to be at the forefront. In addition, modifications to regulations will help support the change needed, while funding issues, lack of resources, and labor changes will continue to force the change that is required[5]."

Creating a Training Strategy

As we've mentioned, actually creating a training strategy from the ground up can be challenging. Let's break it down into a few steps to help you get started.

1.

Set a Schedule and Budget

One of the biggest challenges for creating a L&D program is not enough time or money, right? The truth is, relying on old-school training methods are not budget-friendly or even that effective. Relying solely on in-person training takes a lot of time and requires a lot of resources for travel and downtime.

The solution? Create a blended learning approach where employees learn both online and in-person.

Consolidating training through one platform and for all employees is far less expensive than having licensed employees manage their license renewals separately. And using a platform like Vector Solutions makes it easier for employees to take the minimum courses needed to fulfill license requirements.

Altogether, creating a more efficient training program will save time and money, making it easier to plan for both the year ahead.

2.

Select the Right Training Topics

The next step is to hone in on the training that matters most. Naturally, there will always be training that is mandatory. But what are the other continuing education topics that matter to your workforce? Is it sustainability practices? New technology? Something else?

Ask your workforce what they want to know about or what topics they struggle with and ensure those topics are part of your training curriculum. Also consider asking your training vendor what the most popular courses are for the industry.

And keep an eye on the future. What are the new and emerging trends that are going to shape the industry in the next few years? Use training to make yourself more resilient and ready to adapt to the future of the industry.

$1,200

The average spent on training per employee by AEC companies
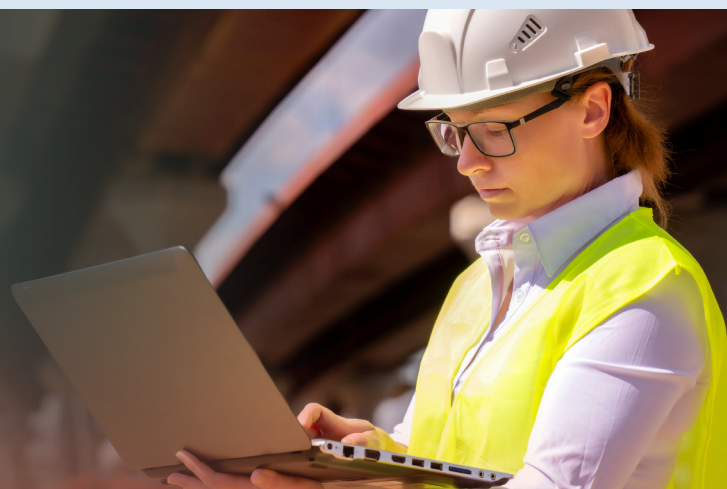
3.

Select Your Training Processes

We asked AEC professionals what types of formal training processes were in place at their organizations. Most often, they cited activities like new employee orientation, progression training, competency assessments, and development plans. A smaller number of respondents also pointed to individual development plans, mentoring, and coaching.

Companies are also increasing their adoption of digitized and virtual training, making it possible to scale learning in a cost-effective way. In fact, industry analysts suggest that by 2025, there will be nearly 60 million users of Augmented Reality training applications across verticals such as manufacturing and AEC[11].

But remember that big changes never happen overnight. Consider where your training program is currently at. If you're currently only training in person and tracking manually, the next step might be to invest in a learning management system (LMS). If you already use an LMS but find the content isn't engaging enough, investigate content providers with modern training materials.

4.

Implement, Measure, and Adapt

The best way to continuously improve is to test, collect feedback, and adjust. After implementing your new training program, ask employees to share their feedback. Then take that feedback and continue to adapt!

> **"One of the persistent practical challenges in moving from classroom to online is managing distraction. I think one of the reasons we've continued to do in-person training as much as we have in the past is that taking people out of their normal workspace minimizes distraction... it's something where we need to think about creative solutions to help people focus."**

Julie Dirksen
Learning Strategy Consultant, Usable Learning

How Vector Solutions Can Help

Vector Solutions is the leading provider of award-winning, intelligent SaaS solutions that help organizations prepare for more challenging workplaces. Our eLearning management software, paired with our extensive and curated content for architects, engineers, and construction employees, meets the unique needs of the industry – whether it's skills, safety, continuing education, or leadership training that is needed.

+31M
Users annually

+24K
Customers worldwide

99.9%
Platform uptime

200+
SME course developers

40+
Languages

Powerful LMS Built for the AEC Industry

Vector Solutions has spent decades working with AEC firms to build and continually improve our award-winning learning management system (LMS).

Our platform provides tools that help firms manage job training and continuing education requirements, improve operational efficiencies, ensure compliance, minimize risk, and reduce costs.

Award-Winning Online AEC Training Courses

Vector Solutions sets the standard for accredited online training and continuing education courses for the AEC industry. Vector offers online AEC courses to keep continuing education licenses & certifications up to date, to onboard new employees, help employees develop job skills, fulfill compliance-training requirements, and create a safer, healthier workplace.

Our online courses include live, instructor-led webinars for continuing education as well as online multimedia e-learning courses in SCORM format that feature 3D animations. Additional course features include:

Multi-language Translations
Our courses are translated into 40+ different languages

Train on Any Device
our mobile optimized content that adapts to the layout of your learners' devices

View Courses Anywhere
With variable bitrate technology automatically adjusts video quality to limit buffering

Access What You Need When You Need It
With interactive transcript, making it easy to search and advance to selected topics

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