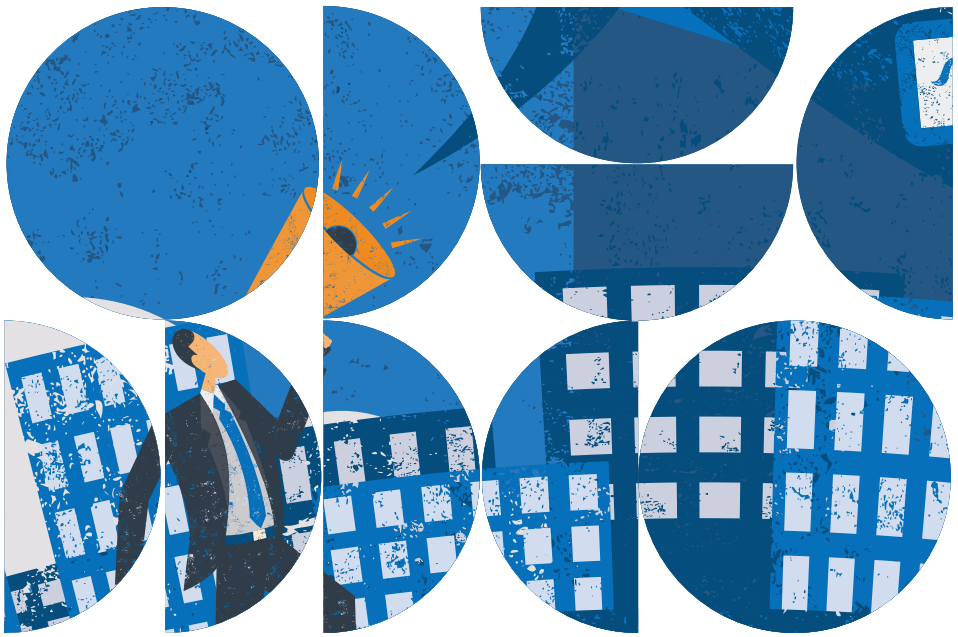
EAB

Guide to Launching **In-House Talent Development Program** in Facilities Management

Facilities Forum



EAB

Who Should Read

Senior Facilities Officer
Facilities Training Leader
Facilities HR Liaison

Guide to Launching In-House Talent Development Program in Facilities Management

Three Ways to Use This Guide

- Design an effective apprenticeship, pre-apprenticeship, or formalized upskilling program
- Recruit quality candidates and select training and recruitment partners
- Explore case studies from diverse and successful higher education institutions

Facilities Forum

Project Director

Kaitlyn Maloney, MSEd, CPA

Contributing Consultants

Lisa Berglund, MPP
Elizabeth Denny
Michael Fischer
Rebecca Stefaniak, MSEd

Design Consultant

Alyssa Dillon

Practice Manager

Ann Forman Lippens

Managing Director

John Workman, PhD

About EAB

EAB is a best practices firm that uses a combination of research, technology, and data-enabled services to improve the performance of more than 1,400 educational organizations. EAB forges and finds the best new ideas and proven practices from its network of thousands of leaders, then customizes and hardwires them into every level of member organizations, creating enduring value. For more information, visit eab.com.

About the Facilities Forum

The Facilities Forum serves Facilities leaders from colleges and universities across North America. Our dedicated research team works to identify and share proven solutions to higher education's toughest operations and maintenance, space management, and capital planning and design challenges. The Forum serves over 150 institutions and their heads of Facilities.

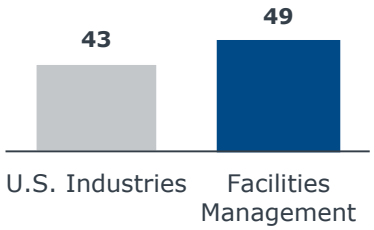
Table of Contents

Executive Summary

The Graying of the Trades

One of the greatest workforce challenges facing senior Facilities leaders is recruiting and developing skilled tradespeople. While retention tends to be strong once employees join an institution, many Facilities departments across North America are seeing a growing number of vacancies as they struggle to source and recruit talent.

Average Age of U.S. Labor Force



1:5 One new tradesperson is entering industry for every five retiring

One reason for high vacancies is the "graying" of the trades. Facilities Management (FM) employees are six years older than the average U.S. employee. Another driver is insufficient new entrants to trades careers. The number of new workers entering the trades is declining. In the United States, there is currently only one new person entering the skilled trades for every five who retire.

Renewed Focus on Talent Development Programs

These workforce challenges mean that fewer institutions can rely on the current pool of skilled tradespeople to fill every role. Instead, senior leaders increasingly recognize they must create in-house skilled trades development programs. There are three types of talent development programs in higher education Facilities: apprenticeship programs, formalized upskilling programs, and pre-apprenticeship programs.

Apprenticeship programs are the most well-known "grow your own" talent solution. In recent years, government leaders have renewed their focus on apprenticeships as a solution to national workforce challenges. One study showed that for every dollar invested in apprenticeship programs, employers see $1.50 in returns in the form of lower recruitment and turnover costs and increased productivity among graduates.

The second type is a **formalized upskilling program**. These programs focus on on-the-job training and largely target internal candidates. Graduates do not earn industry-recognized credentials (as apprentices do). Rather, they gain the skills necessary to fill specific roles in their institutions.

The final type of program is a **pre-apprenticeship program**. Pre-apprenticeship programs train participants for a relatively short period of time to give them the foundational skills they need to be successful in an apprenticeship program. They are designed for people who are not yet ready for formalized upskilling or apprenticeship programs but who (with some additional investment) could move into one of those programs.

How to Launch a Talent Development Program in Facilities Management

This resource supports Facilities leaders in developing and launching in-house talent development programs. The first section provides detailed guidance on how to select the right trades on which to focus, design a program, and (if necessary) register the program with the Department of Labor.

The second section offers a series of detailed case studies to provide an in-depth overview of talent development programs within higher education Facilities Management. Leaders can use these case studies to identify programs to emulate, so that they do not have to reinvent the wheel.

EAB

1 **The Case for Investing in Facilities Talent Development Programs**

2 Step-by-Step Guide for Launching In-House Talent Development Program

3 Case Studies of Talent Development Programs in Higher Education Facilities Management

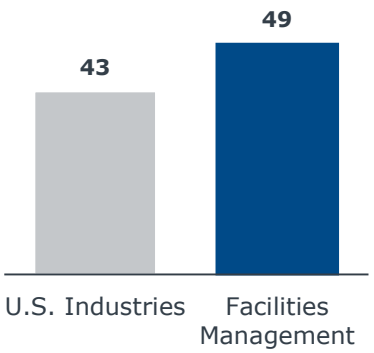
The Graying of the Trades

Large Numbers of Skilled Tradespersons Nearing Retirement

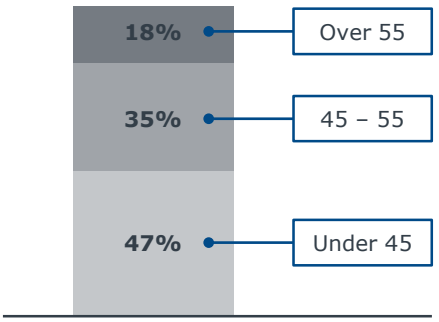
One of the greatest workforce challenges facing senior Facilities leaders is recruiting and developing skilled tradespeople. While retention tends to be strong once employees join an institution, many Facilities departments across North America see a growing number of vacancies as they struggle to source and recruit talent. There are three main drivers of this problem.

The first reason for high vacancy rates is the "graying" of the trades. Facilities Management (FM) employees are six years older than the average U.S. employee (49 vs. 43 years old), and nearly one in five FM employees are over the age of 55.

Average Age of U.S. Labor Force



Age Distribution of Facilities Workers, U.S. Average



Source: Carlson S, "The Graying of the Campus-Facilities Work Force: Who Will Keep the Lights on?," *The Chronicle of Higher Education*, July 27, 2009; JLL, "Are Millennials the Future of Facilities Management?"; Wright J, "America's Skilled Trades Dilemma," *Forbes*, March 7, 2013; Facilities Forum interviews and analysis.

Destination Job No More

New Generations Entering Trades Insufficient to Replace Retirees

The second driver is insufficient new entrants to trades careers. While the number of tradespeople retiring is increasing, the number of new workers entering the trades is declining. In the United States, there is currently only one new person entering the skilled trades for every five who retire.

Two factors are contributing to this decline. First, public perception of the trades is at an all time low. The majority of millennials have little to no interest in construction careers.[1] Many believe construction work is "mindless, dirty, and dangerous."[1] Their parents also have low opinions of trades work, and some are actively discouraging their children from entering trades careers.

Second, today's youth are less aware of trades careers than their 20th-century counterparts. As policymakers have pushed increased access to 4-year postsecondary degrees, K-12 systems have disinvested from vocational education. The number of vocational credits completed by U.S. high school students decreased by 14% between 2000 and 2009.

1:5

One new tradesperson is entering industry for every five retiring

66%

of Generation Z has little to no interest in construction careers

44%

of parents think construction careers will negatively impact their child's financial goals

14%

decrease in vocational education credits taken by high school graduates between 2000 and 2009

1) "Selling 'Skilled Trades' to Millennials."

Source: Go Build Alabama; "Reality Check: The US Job Market and Students' Academic and Career Paths Necessitate Enhanced Vocational Education in High Schools," *NEA*, March 2012; "Shortage of Skilled Workers Creating a Crisis in Construction Industry," *Memphis Daily News,* March 11, 2017; Facilities Forum interviews and analysis.

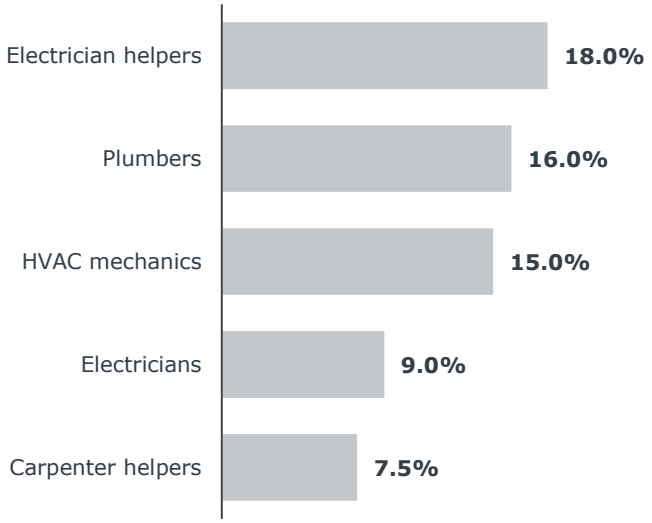
Spreading the Talent Even Thinner

Private Sector Recruiting Exacerbates Supply-Demand Mismatch

The final driver of high skilled trades vacancies in higher education is intense private sector competition for trades talent. The private sector has seen a boom in post-recession construction opportunities, meaning that existing talent is spread even thinner. The graph below shows that trades roles—including journey- and helper-level roles—project higher than average growth rates across the next decade. As a result of this private sector demand, skilled trades roles are currently the hardest positions to fill in both the U.S. and Canada.

Construction Trades Predicted to Have Fastest Employment Growth in U.S. Economy

Select Projected Job Growth Rates, 2016-2024



#1 Skilled trades positions are the hardest roles to fill in U.S. and Canada

62% of private sector firms are struggling to fill skilled trades jobs

Exacerbating this tension between private sector employers and universities are the unique circumstances involved in recruiting talent to higher education. Most significantly, educational institutions cannot offer competitive salaries. They often pay about 20% less than their private sector competitors. Even if an institution can raise wages one year, future operating budgets aren't always certain. At times, Facilities leaders may even be limited to raising wages only for vacant positions, which creates salary compression issues with current staff. On top of that, colleges and universities require a skilled workforce that can manage very old or very new and complex buildings. Taken together, this means that universities and colleges must hire adaptable technicians capable of responding to a range of building needs.

Source: Adecco, "Vocational Skills – Skilled Trades Are in Demand As Boomers Retire"; Bureau of Labor Statistics; Manpower Group, "Talent Shortage Survey"; Tradesmen International, "Skilled Trade Demand Growing Through 2024"; Facilities Forum interviews and analysis.

A Renewed Focus on a Long-Standing Solution

Apprenticeship Programs Have Proven ROI, Multiple Workforce Benefits

These workforce challenges mean that fewer institutions can rely on the current pool of skilled tradespeople to fill every role. Instead, senior leaders increasingly recognize they must create in-house skilled trades development programs. These programs will help institutions grow the pool of potential candidates by enabling them to hire less qualified individuals, and then teach them to have the skills necessary for Facilities Management skilled trades roles.

There are three types of talent development programs in higher education Facilities: apprenticeship programs, formalized upskilling programs, and pre-apprenticeship programs. These are described across the next three pages.

Recent Bipartisan Support for Expanding Apprenticeships Across Industries…

…Reflects High Program Returns for Participants and Employers

Return on Investment

- Enhance recruitment
- Reduce turnover and increase productivity relative to non-apprentice candidates
- Augment soft skills
- Improve workforce engagement

Apprenticeship programs are the most well-known "grow your own" talent solution. In recent years, government leaders have renewed their focus on apprenticeships as a solution to national workforce challenges. The Obama administration committed to doubling the number of apprenticeship programs in the U.S. Similarly, President Trump announced $200 million in apprenticeship funding in 2017.

Moreover, a Department of Commerce study showed that for every dollar invested in apprenticeship programs, employers see $1.50 in returns. These returns come in the form of lower recruitment and turnover costs and increased productivity among apprenticeship program graduates.

Source: Bahler K, "Trump Announces $200 Million in Apprenticeship Funding," *Time*, June 15, 2017; Department of Commerce, "The Benefits and Costs of Apprenticeships: A Business Perspective," November 16, 2016; Jagoda N, "Obama Administration Awards $50 Million in Apprenticeship Grants," *The Hill*, October 21, 2016; Smith A, "Expanding Apprenticeships Across More Jobs," *Inside Higher Ed,* December 1, 2017; Facilities Forum interviews and analysis.

Shorter, More Customizable Training Alternatives

Upskilling Programs Fill Less Regulated Trades Roles

The second type of in-house talent development program in use at some institutions is a **formalized upskilling program**. Formalized upskilling programs serve a purpose identical to apprenticeship programs: they develop talent to fill high-demand trades roles. However, the execution of upskilling programs is slightly different, as summarized in the table below. At their core, formalized upskilling programs focus on on-the-job training. They may include classroom instruction, but they can achieve their purpose without classroom elements. Apprenticeship programs, on the other hand, require a mix of classroom and on-the-job training. Formalized upskilling programs almost exclusively target internal candidates, whereas apprenticeships can seek internal and external candidates. Formalized upskilling programs also tend to be shorter, ranging from one to three years, compared to four or more for apprenticeship programs.

Finally, program graduates do not earn industry-recognized credentials, as apprentices do. Rather, they are simply qualified to fill specific roles in their institution. This means that institutions can launch a formalized upskilling program and begin to train candidates faster. This also explains why programs tend to target internal candidates—it is more difficult to recruit externally for a program that does not grant portable credentials. **Ultimately, formalized upskilling programs are best suited to roles without rigorous certification requirements.** (Importantly, certification requirements for roles like plant utility assistants and maintenance mechanics vary by state and province. Institutions must decide independently which roles to focus on.)

Comparison of Scalable Apprenticeships to Formalized Upskilling Programs

	Scalable Apprenticeship Programs	Formalized Upskilling Programs
Facilities Unit Goal	Develop talent to fill high-demand trades roles	Develop talent to fill high-demand trades roles
Target Roles	Electrical, plumbing, HVAC	Maintenance technician, structural trades, plant utilities assistant
Training	Combination of on-the-job learning and related technical instruction	On-the-job learning required; related technical instruction optional
Target Audience	Internal or external candidates	Primarily internal candidates (e.g., custodial, grounds, helpers)
Length	Typically, 3-6 years	Typically, 1-3 years
Outcome	Participants earn industry-recognized credentials	Participants develop skills required to meet institution-specific trade needs

Source: Facilities Forum interviews and analysis.

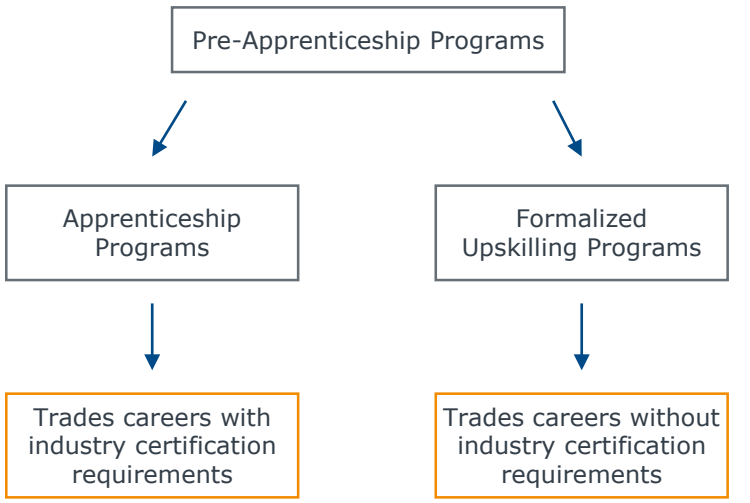
Targeting Nontraditional Pipelines

Pre-Apprenticeships Grow Talent Pool While Advancing Diversity in Shops

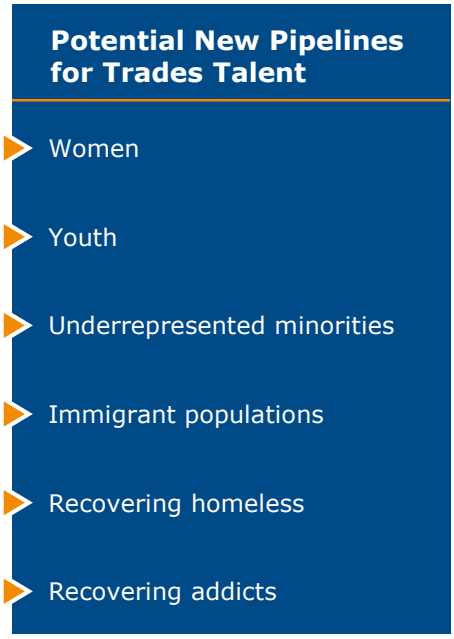
The final type of development program is a **pre-apprenticeship program**. This program meets a specific need that not all institutions have, and is likely not a program that Facilities leaders should consider unless they also have a formalized upskilling or apprenticeship program.

Pre-apprenticeship programs train participants for a relatively short period of time to give them foundational skills they need to be successful in an apprenticeship program. They are designed for people who are not yet ready for formalized upskilling or apprenticeship programs, but who, with some additional investment, could move into one of those programs. How they fit into the trades career pipeline is illustrated in the graphic below. The right box lists potential pipeline categories, such as women, underrepresented youth, and immigrant populations.

Pre-Apprenticeships Provide Foundational Skills to Access Trades Careers Training Programs



Potential New Pipelines for Trades Talent



Importantly, these groups of employees are not categorically underprepared for apprenticeships or formalized upskilling programs today. But many people within these groups face barriers to accessing skilled trades work. For instance, they may lack language or literacy skills. Pre-apprenticeship programs identify and break down these barriers so candidates are set up for success in next-level programs. Ultimately, pre-apprenticeship programs create another source of talent for hard-to-fill roles. As a secondary benefit, they can diversify the workforce.

Source: Facilities Forum interviews and analysis.

How to Launch a Talent Development Program in FM[1]

This two-part resource supports Facilities leaders in developing and launching in-house talent development programs. The first section provides detailed guidance on how to select the right trades on which to focus, design a program, and (if necessary) register the program with a state or federal Department of Labor. The second section offers a series of detailed case studies to provide an in-depth overview of talent development programs within higher education Facilities Management. Leaders can use these case studies to identify programs to emulate, so that they do not have to reinvent the wheel.

Section 1

Step-by-Step Guide for Launching In-House Talent Development Program

Step	Apprenticeship Program	Formalized Upskilling Program	Pre-Apprenticeship Program[1]
Pinpoint Trade(s) to Grow Through Talent Development Program			
1. Analyze internal workforce data	✓	✓	✓
2. Determine program viability	✓	✓	✓
3. Determine best-fit talent development program	✓	✓	✓
Create an Operational Plan			
4. Assign leadership responsibilities	✓	✓	✓
5. Determine program costs	✓	✓	✓
6. Identify funding sources	✓	✓	✓
7. Set program goals and evaluation mechanisms	✓	✓	✓
Register U.S. Apprenticeship Program with Government Agency			
8. Weigh whether to register apprenticeship program	✓	N/A	N/A
9. Register U.S. apprenticeship program	✓	N/A	N/A
Design Your Program			
10. Select a training partner	✓	✓	✓
11. Select mentor(s) to lead on-the-job training	✓	✓	✓
12. Determine required competencies	✓	✓	✓
13. Build training schedule	✓	✓	✓
14. Complete necessary program documentation	✓	✓	✓
Recruit Program Candidates			
15. Market talent development program	✓	✓	✓
16. Build relationships with recruitment partners	✓	N/A	✓

Section 2

Case Studies of Talent Development Programs in Higher Education Facilities Management

- California State University San Marcos
- Northwestern University
- University of Alberta
- University of Arkansas
- University of Colorado Boulder
- University of Massachusetts Amherst
- University of Virginia

For supporting materials such as job description and apprentice competency lists, please visit eab.com/facilitiestalent.

This resource offers guidance on launching all three types of programs: apprenticeship, formalized upskilling, and pre-apprenticeship. However, the focus is largely on apprenticeships and formalized upskilling programs. Institutions generally should build pre-apprenticeship programs only after they have established an apprenticeship or formalized upskilling program.

1) Facilities Management.

Source: Facilities Forum interviews and analysis.

Introduction to the Talent Development Checklist

This section provides a step-by-step guide to launching an in-house talent development program. To orient readers to the overall process, the table on the following page outlines each step and signals the programs to which that step applies. While many of the steps are the same across program types, some apply only to certain programs. Apprenticeship programs have the most steps, and upskilling programs have the fewest.

The steps begin on page 18. While there are any steps that go into program development, this guide identifies and shares guidance on the most important steps to get right. The table on the following page lists those most critical steps and identifies which steps apply to which programs. The remainder of this section shares implementation guidance and tools for each step.

Source: Facilities Forum interviews and analysis.

Talent Development Checklist

Step	Apprenticeship Program	Formalized Upskilling Program	Pre-Apprenticeship Program[1]
Pinpoint Trade(s) to Grow Through Talent Development Program			
1. Analyze internal workforce data	✓	✓	✓
2. Determine program viability	✓	✓	✓
3. Determine best-fit talent development program	✓	✓	✓
Create an Operational Plan			
4. Assign leadership responsibilities	✓	✓	✓
5. Determine program costs	✓	✓	✓
6. Identify funding sources	✓	✓	✓
7. Set program goals and evaluation mechanisms	✓	✓	✓
Register U.S. Apprenticeship Program with Government Agency			
8. Weigh whether to register apprenticeship program	✓	N/A	N/A
9. Register U.S. apprenticeship program	✓	N/A	N/A
Design Your Program			
10. Select a training partner	✓	✓	✓
11. Select mentor(s) to lead on-the-job training	✓	✓	✓
12. Determine required competencies	✓	✓	✓
13. Build training schedule	✓	✓	✓
14. Complete necessary program documentation	✓	✓	✓
Recruit Program Candidates			
15. Market talent development program	✓	✓	✓
16. Build relationships with recruitment partners	✓	N/A	✓

1) Institutions should only consider a pre-apprenticeship program as a way to source candidates for an existing apprenticeship or upskilling program.

Source: Facilities Forum interviews and analysis.

1. Analyze Internal Workforce Data

Step 1 is to analyze internal workforce data, which will inform which type of talent development program to launch. Institutions should focus on shops with the highest projected vacancy rates. Leaders can assume an average staff retirement age of 65 years old, and then estimate projected vacancies by unit. While not 100% accurate, this projection is a helpful starting point for identifying future gaps.

The University of Arizona used vacancy projections to inform its apprenticeship program. Facilities leaders at Arizona built a spreadsheet to track how many employees each shop currently has. Then, assuming a retirement age of 65 Arizona projected out how many vacancies they might experience across the next decade. The final tally indicated which shops—masonry, paint, or plant—would be hit hardest by retirements.

The University of Arizona Retirement Projections Worksheet is shown in full below. Download an editable digital version from eab.com/facilitiestalent.

University of Arizona Facilities Retirement Projections, by Shop

	Current FTEs	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	Retirement Potential	Total Percentage
Electric	**28**	4	2	2	0	1	1	1	0	1	1	**13**	**46%**
Plumbing	**22**	2	0	0	1	0	0	1	1	0	2	**7**	**32%**
HVAC	**18**	3	0	1	1	1	0	0	0	0	1	**7**	**39%**
BAS[1]/ Controls	**16**	1	1	0	1	0	0	0	0	2	0	**5**	**39%**
Plants	**22**	1	2	0	1	4	0	3	0	0	2	**13**	**59%**
Sheet Metal	**20**	2	1	1	0	0	1	0	1	0	2	**8**	**40%**
Paint	**23**	7	1	0	1	1	1	1	0	1	2	**15**	**65%**
Carpentry	**26**	9	0	2	0	1	1	1	1	0	0	**15**	**58%**
Masons	**8**	1	0	1	1	2	0	0	1	1	0	**7**	**88%**

1) Building automation system.

Source: University of Arizona, Tucson, AZ; Facilities Forum interviews and analysis.

2. Determine Program Viability

Step 2 is to determine the viability of creating a successful talent development program at your institution. The tool below guides leaders through an evaluation process to determine program feasibility. To use this tool effectively, leaders should possess a basic understanding of the resources potentially available to support this endeavor.

Directions: Score each of the six qualitative criteria based on your level of agreement with the statement, either zero (disagree), one (somewhat agree), or two (strongly agree). After scoring each criterion, record your answers on the scoring sheet on page 21 and follow the directions to calculate a total weighted score. The final score corresponds to the program's viability.

Criteria	Statement	Relevance to Program Creation	Agreement Score
Projected Shop Vacancy Rate	The institution will have openings in certain shops, considering the projected vacancy rate.	Shop growth rate should be the first consideration when deciding if it is necessary to create your own pipeline program.	
Organizational Capacity	The institution possesses sufficient resources (at least 0.5 FTE) to oversee all phases of the program.	Developing and managing a talent development program requires oversight and program management. Institutions must ensure they have the necessary resources to manage and effectively lead participants through a successful program.	
Availability of Mentors	The identified shops have journeyworkers who are willing and able to serve as mentors. These journeyworkers have the capacity and ability to train others.	Especially in formalized upskilling and apprenticeship programs, participants need a journeyworker to serve as a mentor. This person will provide training and support throughout the program. In registered apprenticeship programs, institutions are required to report their ratio of journeyworkers to apprentices to the Department of Labor.	
Stakeholder Support	Stakeholders such as Facilities leaders and senior administrators recognize the strategic value of the program and support its development.	Campus leaders are more likely to support initiatives that further an institution's strategic priorities. Often, talent development programs can reinforce priorities around community support, education, and the lasting physical health of the campus. Making this connection can ease the process of securing funding and support long-term viability.	

Agreement Score Scale		
Disagree = 0	**Somewhat Agree = 1**	**Strongly Agree = 2**

Source: Facilities Forum interviews and analysis.

2. Determine Program Viability (cont.)

Criteria	Statement	Relevance to Program Creation	Agreement Score
Financial Resources	The Facilities unit or central administration has sufficient resources and is willing to fund the program. This includes funding for program participant salaries (if applicable) and future funding if the institution is interested in hiring program participants.	Facilities must have resources to dedicate to the talent development program. See page 27 for funding strategies.	
Training Partner Proximity	Training partners exist in the surrounding area; alternatively, the Facilities unit is willing to use online training resources.	Most talent development programs require a related instruction component. Institutions should determine whether necessary classes already exist in their area, and if not, what other resources they can make available to participants.	

Agreement Score Scale		
Disagree = 0	**Somewhat Agree = 1**	**Strongly Agree = 2**

Source: Facilities Forum interviews and analysis.

2. Determine Program Viability (cont.)

Calculating a Total Program Viability Score

After scoring each criterion, record the answers in the **Score** column below. The total score corresponds to the level of program viability: high, medium, or low.

Criteria	Score
Organizational Capacity	
Shop Growth Rates	
Capacity for Mentors	
Financial Resources	
Stakeholder Support	
Training Partner Proximity	
Total Score	

Total Score	Program Viability
0-4 points	**Low**
5-8 points	**Medium**
9-12 points	**High**

Source: Facilities Forum interviews and analysis.

3. Determine Best-Fit Talent Development Program

Step 3 is to choose the program type that best fits your institution's needs. Facilities leaders should consider these straightforward prompts to determine the right program type.

*Pursue an **apprenticeship program** if…*

…the trades your institution most urgently needs, such as electrical or plumbing, have rigorous certification requirements[1].

*Pursue a **formalized upskilling program** if…*

….the trades your institution most urgently needs do not have rigorous certification requirements in your state or province.

*Pursue a **pre-apprenticeship program** if…*

…your institution has an apprenticeship program or formalized upskilling program but is struggling to source qualified candidates (either internally or externally) to fill the program.

1) In most states, certification requirements vary by trade and locality.

Source: Facilities Forum interviews and analysis.

4. Assign Leadership Responsibilities

Step 4 is to create a plan to operationalize the talent development program. Senior leaders must decide which Facilities staff members will be responsible for which program components. At a minimum, talent development programs require a leader (i.e., a part- or full-time program manager) and a decision-making body (this body can be a single person or a committee).

The table below outlines roles, responsibilities, and case studies detailing how institutions assigned a given responsibility.

Program Roles and Responsibilities

Role	Responsibility	Typical Participant/Owner	Example
Decision-Making Authority	Senior leader or committee responsible for the creation and management of talent program. Makes decisions about program structure, training, mentorship, participant evaluation, and program evaluation. Ensures all necessary paperwork and documentation are completed and filed.	This responsibility is typically owned by a committee that consists of: • Senior Facilities officer (chair) • Program manager (see following) • Head(s) of any shop(s) represented in program • HR representative • Union representative, if relevant • Community partners, if relevant	The University of Arizona's original apprenticeship committee consisted of: • An assistant director who oversaw the shops with apprentices • Shop supervisors • Interested team leads Arizona also invited shop supervisors who had experienced a now-defunct apprenticeship program at the university to participate. These veteran supervisors were able to offer guidance, advocate for the new program, and share what worked and what didn't about the previous program.
Quality Assurance	This is a designated person to receive and respond to complaints. This role is mandatory for federally registered U.S. programs.	• Program manager • Senior Facilities Officer (SFO)	California State University San Marcos uses a joint apprenticeship committee in which a state representative is responsible for the adherence of the program to state regulations.
Participant Evaluation	This can be an individual or group of people who assess the progress of program participants.	• Program committee • Shop supervisor • Program manager • Assigned mentor • Trainee supervisors	The University of Virginia conducts monthly assessments of their apprentices that involve the apprentice, their current trainer, and their supervisor. The notes from this assessment and meeting are submitted to the program manager.

Source: California State University San Marcos, San Marcos, CA; University of Arizona, Tucson, AZ; University of Virginia, Charlottesville, VA: Facilities Forum interviews and analysis.

4. Assign Leadership Responsibilities (cont.)

Program Roles and Responsibilities (cont.)

Role	Responsibility	Typical Participant/Owner	Example
Program Manager	This role is responsible for completing (or delegating) the everyday tasks of managing the program and tracking participant progress. Responsibilities include: • Reaching out to potential candidates • Screening candidates for minimum program requirements (e.g., age, work experience) • Conducting interviews with potential candidates • Tracking participants' progress • Identifying training facilities/classroom space • Procuring instructional equipment and supplies • Identifying mentors for on-the-job training • Liaising with related training partners • Tracking and reporting program outcomes • Circulating program success stories	• Mid-level administrator • HR business partner	Institutions that manage smaller apprenticeship programs (under four apprentices), pre-apprenticeship programs, and general upskilling programs likely only need a part-time staff member to manage the program. Larger programs, like at the University of Virginia, have a full-time employee dedicated solely to occupational training like apprenticeships.

Source: AppreniceshipUSA, *Advancing Apprenticeship as a Workforce Strategy: An Assessment and Planning Tool for the Public Workforce System*; University of Virginia, Charlottesville, VA: Facilities Forum interviews and analysis.

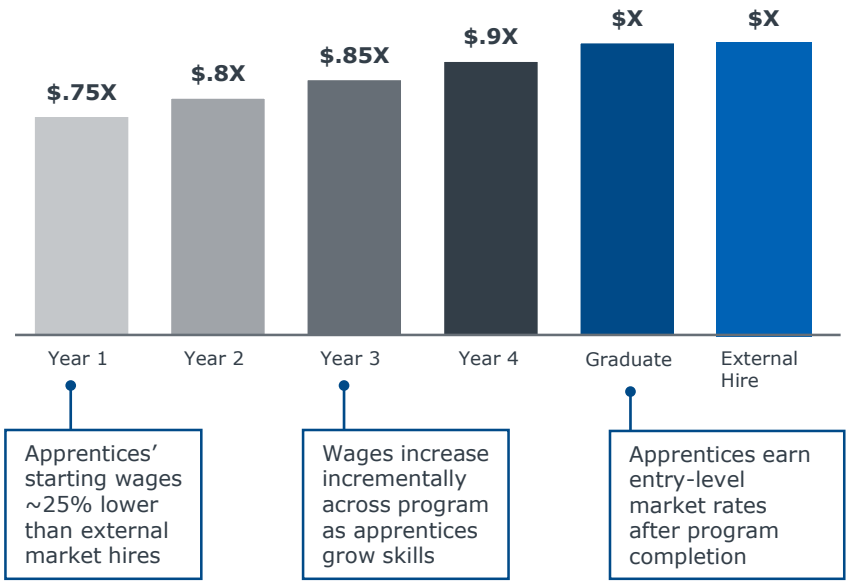
5. Determine Program Costs

Step 5 is to determine the cost of operating a talent development program. While many institutions predict that program costs (especially for apprentice programs) will be insurmountably high, in reality, the financial burden is often much lower than expected. While starting a program requires upfront time and resources, these programs do not require significant ongoing expenditures. Pre-apprentices, for example, don't receive salaries until they are hired, and employees in apprenticeships and formalized upskilling programs typically earn below market wages, reflecting their status as trainees.

Similarly, many institutions report that they actually save money by using apprentices. As illustrated in the chart below, apprentice salaries generally start at about 25% lower than the market rate. Then, wages incrementally increase toward the market rate each year. Most costs during the program beyond salaries are marginal, covering expenses such as books, supplies, and related coursework. The University of Massachusetts Amherst, for example, estimates that it spends between $5,000 and $15,000 per apprentice per year.

Apprentice Wages Year Over Year Relative to Market Rate

Wages Typically Lower than Market Rate



Non-Wage Program Costs Are Typically Marginal

- Tuition and fees
- Textbooks
- Equipment
- Program administration

Source: University of Massachusetts Amherst, Amherst, MA; Facilities Forum interviews and analysis.

5. Determine Program Costs (cont.)

Below is an example of the wage schedule for apprentices at the University of Arkansas.

University of Arkansas Apprentice Hourly Wage Progression

Apprentice Type	Year 1	Year 2	Year 3	Year 4	Completion
Plumbing	$10.63	$14.14 (+33%)	$16.24 (+15%)	$17.51 (+8%)	$19.40 (+11%)
Electric	$10.63	$14.14 (+33%)	$16.24 (+15%)	$17.51 (+8%)	$19.40 (+11%)
Carpentry/ Locksmith	$10.63	$12.84 (+21%)	$14.16 (+10%)	$14.96 (+6%)	$16.15 (+8%)
Heating Plant	$10.63	$13.68 (+29%)	$15.99 (+17%)	$17.19 (+8%)	$19.00 (+11%)

Talent Development Program Budgeting Worksheet

Download and use the budgeting worksheet at eab.com/facilitiestalent to think through the costs associated with a talent development program. To identify funding sources, use the guidance in the following section.

Source: University of Arkansas, Fayetteville, AK; Facilities Forum interviews and analysis.

6. Identify Funding Sources

After determining how much a program will cost, step 6 is to acquire funding. Institutions with in-house talent development programs most often rely on the following funding sources:

Vacant salary lines
The most common way to fund programs is to repurpose vacant salary lines to fund talent development programs. Institutions will need to check internal policies to find out whether this is possible.

Chargebacks
If institutions have a responsibility center management budget model, and/or they already charge academic and administrative units for Facilities costs, they can fund the program through chargebacks. This can be a palatable option for institutions with chargebacks already, as trainees typically incur a lower rate for their work than experienced employees.

Central strategic funding
Some programs secure a new funding stream from central administration. This typically requires making a business case for why the institution should invest in the program. The University of Arizona, for instance, used workforce projections to establish a business need for the apprenticeship program, which convinced senior leaders to fund it centrally.

Government funding
Institutions can pursue grants or loans from various government agencies to fund pre-apprenticeship or apprenticeship programs. *For more information on funding options, see the table on page 28.*

Source: University of Arizona, Tucson, AZ; Facilities Forum interviews and analysis.

6. Identify Funding Sources (cont.)

Government Funding Opportunities for Talent Development Programs

Government Agency	Purpose of Funding	Resources
U.S. Department of Labor	Subsidizes training and support expenses	Workforce Innovation and Opportunity Act funds; Workforce Investment Act funds
U.S. Department of Agriculture	Subsidizes training and education expenses for SNAP participants and provides reimbursements for dependent care and transportation related to the program	Supplemental Nutrition Assistance Program employment and training programs
U.S. Department of Housing and Urban Development	Provides funding to programs employing Section 3 housing residents	Section 3 Covered Housing and Urban Development Financial Assistance Programs
U.S. Department of Education	Provides tuition funds for apprentices	Federal Student Aid
U.S. Department of Veterans Affairs	Provides tuition assistance and additional stipends to veteran apprentices	GI Bill
State Governments	Many states offer tax credits for apprenticeship programs and tuition support for apprentices	States that offer tax credits as of June 2018 are Alabama, Arkansas, Connecticut, Guam, Louisiana, Maryland, Missouri, Montana, Nevada, Rhode Island, South Carolina, Virginia, and West Virginia
Government of Canada [*for employers*]	Claim up to $2,000 per year for each eligible apprentice	Apprenticeship Job Creation Tax Credit
	Provides funding toward outside training costs	Canada Job Grant
Government of Canada [*for apprentices*]	Maximum $4,000 loan during Red Seal training	Canada Apprentice Loan
	Maximum $2,000 grant during Red Seal training	Apprenticeship Incentive Grant
	Maximum $2,000 grant for apprentices who complete their Red Seal training and achieve journeyworker certification	Apprenticeship Completion Grant

Speak with the institution's government agency contact about applying for these grants and tax credits, and encourage program participants to utilize the grants and loans available to them as well.

Source: Facilities Forum interviews and analysis.

7. Set Program Goals and Evaluation Mechanisms

Step 7 is to ensure that a program's effectiveness is consistently monitored by the institution. This requires that program decision-makers first establish what outcomes the program should achieve. Based on these goals, the institution must regularly track metrics, comparing current metrics to target performance and analyzing any gaps.

The following criteria have been adapted from the Manufacturing Institute. Leaders can start with these metrics when building their program evaluation mechanisms.

Classroom Training

The following metrics should be assessed on a semester and annual basis.

- Participant course evaluation scores
- Pass/fail rates
- Actual vs. planned delivery of the curriculum
- Supervisor and on-the-job training (OJT) mentor feedback on whether classroom training is supporting OJT
- Course graduation rates
- Course grades

On-the-Job Training

The following metrics should be assessed biannually.

- Periodic participant evaluations
- Feedback or ratings given to participants during performance evaluations
- Whether participants are achieving performance milestones according to progress requirements
- Feedback from OJT mentors

Instructors and Trainers

The following metrics should be assessed annually on both an individual basis (for each trainer/instructor) and aggregate basis.

- Pass/fail rate of instructor courses
- Actual vs. planned delivery of curriculum
- Actual vs. planned delivery of OJT
- Feedback from participants about instructors and trainers

General Program Metrics

The following metrics should be measured on a monthly and annual basis.

- Actual vs. planned timeline execution
- Budget execution
- Turnover rate
- Number of participants who complete program, by year and cumulatively
- Number and percentage of participants hired by institution upon completion of the program

Source: The Manufacturing Institute, *Employer's Playbook for Building an Apprenticeship Program*; Facilities Forum interviews and analysis.

8. Weigh Whether to Register Apprenticeship Program

Step 8 is to decide whether to register an apprenticeship program with the U.S. government.

Note: The apprenticeship registration process differs for Canadian and U.S. institutions. In Canada, apprentices who complete their apprenticeships and pass the corresponding Red Seal exam earn a Red Seal-registered designation. As a result, Canadian institutions are responsible for creating a program that enables apprentices to pass the exam. Canadian institutions are also typically responsible for creating an apprenticeship agreement, tracking and providing on-the-job training (OJT), and recommending apprentices for the exam, although regulations vary by province and territory.

By comparison, U.S. institutions have the flexibility to decide whether or not to register their apprenticeship program with the Department of Labor (DOL), either through the federal office or through a state-governed branch (this decision is made on a state-by-state basis). The graphic below outlines the pros and cons of partnering with the DOL.

Benefits and Limitations of Government Partnership

✓ Assures quality by reviewing program against accepted industry standards	✓ Enhances recruiting efforts through marketing resources and assistance	✗ Limits design flexibility as programs must meet federal and state training standards
✓ Expedites program development by providing templates and technical support	✓ Provides benefits in the form of tax credits or government funding	✗ May elongate training time for programs in trades without formal certification requirements

There are four main benefits to partnering with the Department of Labor. First, the DOL supports program development by reviewing program quality and providing templates to expedite paperwork. They also support recruitment efforts by sharing sample marketing materials and promoting the program to interested candidates. Moreover, a number of higher education institutions report that simply having DOL approval improves recruitment efforts and helps the program build credibility, as earning a certificate signed by the secretary of labor adds to the value of a program for prospective apprentices. Last, some states offer benefits in the form of tax credits or federal funding (and sometimes offer grants for apprentices).

However, registration might not be the right choice for all programs. Registration can limit design flexibility, since programs have to meet DOL- or state-specific training standards. State and federal Departments of Labor often prescribe minimum hours for instruction and on-the-job training, which some apprentices might not need.

To support institutions in making the decision of whether or not to register, this step outlines the mandatory components of DOL-registered programs. The following pages explain specifically how institutions can register their programs, should they choose to do so.

Source: Facilities Forum interviews and analysis.

8. Weigh Whether to Register Apprenticeship Program (cont.)

To register apprenticeship programs, leaders must comply with federal and state requirements. *The U.S. Labor Standards for the Registration of Apprenticeship Programs* outlines the legal requirements for the registration of apprenticeship programs at the state or federal level. The most relevant sections are summarized below and on the following pages.[1]

For an excerpt of the standards as of June 2018, visit the Appendix. **Contact your appropriate agency contact for further guidance.**

Summary of Federally Registered Apprenticeship Regulations

Regulation Section Title	Summary	Key Points
Eligibility and procedure for registration of an apprenticeship program (§29.3)	Outlines which government agencies with which an institution has to register its apprenticeship; details the process for acquiring permanent approval of registration; and stipulates that a program sponsor must obtain permission from its union (if applicable).	• Each apprentice must be individually registered with the federal or state apprenticeship agency • Agencies must be notified within 45 days of an apprentice joining, leaving, or completing a program • Applications for newly registered apprenticeship programs that meet requirements will be given a one-year probationary approval; after the one-year review, programs can receive permanent registration approval if they still conform to requirements • Subsequent reviews for quality and conformity to requirements will occur at least every five years • Any proposals for modifications of the existing program can be submitted to the registration agency and will receive a response within 90 days • If a union is involved in any way, the institution must provide written acknowledgment of union agreeing or at least not objecting to the program
Criteria for apprenticeable occupations (§29.4)	Describes the types of occupations and associated training that are appropriate for apprenticeship programs.	To be considered an "apprenticeable occupation," an occupation must: • Involve skills that are learned in a practical way through supervised on-the-job training • Be an occupation commonly recognized in its industry • Involve the progressive attainment of skills and knowledge, which takes at least 2,000 hours to attain • Require related instruction to supplement the on-the-job training

1) This analysis was completed in June 2018. All regulations are subject to change. This analysis should not be considered a replacement for your institution's due diligence exercise.

Source: Electronic Code of Federal Regulations, Title 29, Subtitle A, Part 29; Facilities Forum interviews and analysis.

8. Weigh Whether to Register Apprenticeship Program (cont.)

Summary of Federally Registered Apprenticeship Regulations (cont.)

Regulation Section Title	Summary	Key Points
Standards of apprenticeship (§29.5)	Addresses design of the apprenticeship program. Outlines major requirements and considerations such as structure, wages, and outcomes.	The apprenticeship program sponsor must submit a written plan that includes: *Apprenticeship Basic Design* • An acknowledgment of the employment and training of an apprentice in a skilled occupation • The type of apprenticeship (time-based, competency-based, or a hybrid approach)[1] • A progressively increasing wage schedule; the entry wage must not be less than the minimum wage prescribed by the Fair Labor Standards Act ($7.25/hour as of June 2018)[2] *Compliance Requirements* • Compliance with minimum apprentice age requirement (16 years) • Placement of an apprentice under a written Apprenticeship Agreement that includes the program standards • Compliance with state or federal affirmative action guidelines • Contact information for individual in program who will receive and address complaints • Assurance of the creation and maintenance of all program records as required by law *Training* • *(If applicable)* A ratio of apprentices to journeyworkers, as defined by provisions in a collective bargaining agreement • Work processes in which the apprentice will receive on-the-job training, as well as the approximate amount of time to be spent on each work process • Provision for organized instruction related to the occupation. 144 hours/year is the minimum recommendation. Instructors must meet their state's Department of Education requirements for a vocational-technical instructor or be a subject matter expert, and must have received training in teaching techniques and adult learning styles • Adequate and safe equipment and facilities for training and instruction • Presence of qualified training personnel and adequate supervision

1) Time-based designs require the apprentice to spend a minimum of 2,000 hours completing a skill needed for a specific job. Competency-based requires the apprentice to successfully perform certain required tasks or skills. The hybrid approach is a combination of time-based and competency-based designs, and is the most common apprenticeship design.
2) Check minimum wage regulations by state.

Source: Electronic Code of Federal Regulations, Title 29, Subtitle A, Part 29; Facilities Forum interviews and analysis.

8. Weigh Whether to Register Apprenticeship Program (cont.)

Summary of Federally Registered Apprenticeship Regulations (cont.)

Regulation Section Title	Summary	Key Points
Standards of apprenticeship, cont. (§29.5)		*Special Cases* • The granting of advanced standing/credit for previous experience or competencies • Stipulations for apprentices who transfer between programs • Reasonable probationary period for apprentices that is no longer than one year • Allowance for the cancellation of the contract during probationary period by either party
		Evaluation • Periodic review and evaluation of the apprentice's performance
		Credentials and Registration • Identification of the registration agency • Recognition for successful completion of an internship with a certificate from the registration agency • Stated interim credentials, if applicable to program requirements • Provisions to allow the registration, cancellation, deregistration, and modification of the program
Program performance standards (§29.6)	Outlines how to evaluate program performance.	• Registered apprenticeship programs must have at least one apprentice participating at all times[1] • Registration agency must provide technical assistance to programs with completion rates lower than the national average • Note: If an apprentice leaves during the probationary period, it will not affect the program's completion rate

1) See federal guidelines for certain exceptions.

Source: Electronic Code of Federal Regulations, Title 29, Subtitle A, Part 29; Facilities Forum interviews and analysis.

8. Weigh Whether to Register Apprenticeship Program (cont.)

Summary of Federally Registered Apprenticeship Regulations (cont.)

Regulation Section Title	Summary	Key Points
Apprenticeship agreement (§29.7)	Maps out the components required in an apprenticeship agreement, including demographic information, wages, and minimum competencies or time obligations.	An apprenticeship agreement is a contract between an apprentice and his or her employer that outlines the requirements and expectations for the program. An apprenticeship agreement must include: • Personal information for apprentice and contact information for sponsor and registration agency; request for additional demographic data from apprentice • What occupation the apprentice will be training for and the duration of the program • Statement outlining program standards and schedule of work processes, including wages • Information about the probationary period • Allowance for amending apprenticeship standards • Equal opportunity employment statement • Contact information for individual in program who will receive and address complaints

U.S. Labor Standards

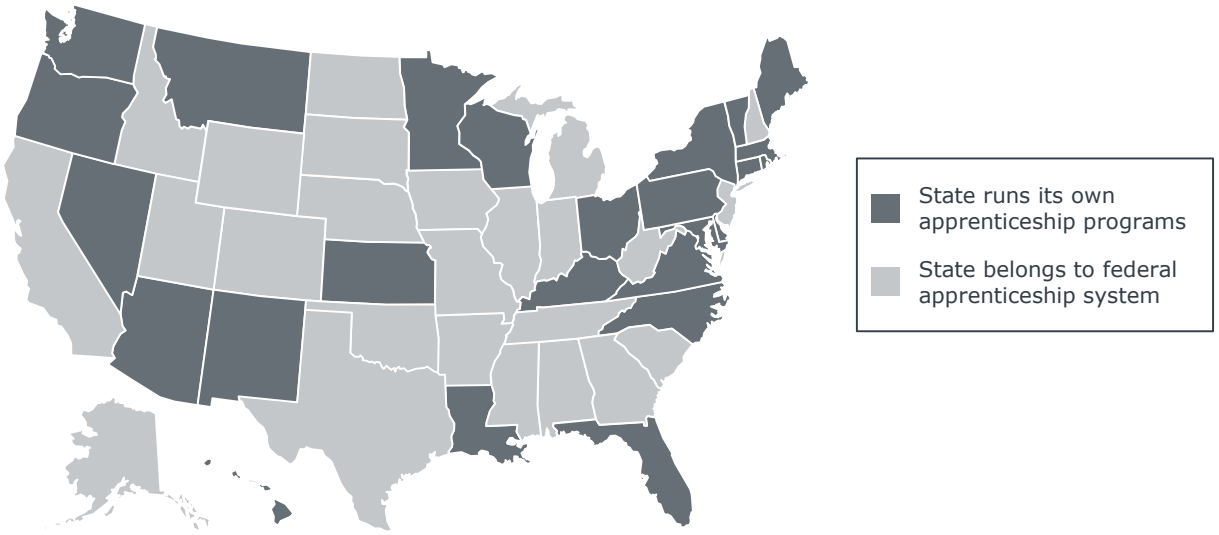
The appendix includes an excerpt of the U.S. Labor Standards for the Registration of Apprenticeship Programs, which includes the legal requirements of the aforementioned sections as of June 2018. **Contact your appropriate agency contact for further guidance.**

Source: Electronic Code of Federal Regulations, Title 29, Subtitle A, Part 29; Facilities Forum interviews and analysis.

9. Register U.S. Apprenticeship Program

Step 9 is to register the apprenticeship program, if applicable. If an institution chooses to register its apprenticeship program, the registration process varies depending on whether the state or federal government manages the program. The map below indicates states that manage their own apprenticeship standards in dark grey.

DOL Apprenticeship Management by State



State-managed apprenticeship programs typically need to be approved by a state council or agency. Each state has its own process and application.

Federally managed apprenticeship programs are approved through the Department of Labor (DOL). The DOL uses templates called "boilerplates," which are forms that outline what elements an institution must have in place to meet federal registration guidelines.

Each state has its own contact office that is connected with either the state or federal government. Institutions that have registered programs with government contacts report that this office or person is a helpful resource and can be consulted as questions or issues arise.

For the most current list of contacts, visit the respective government webpage.

- For U.S. institutions, visit the Department of Labor website here.
- For Canadian institutions, visit the Red Seal website here.

Source: Facilities Forum interviews and analysis.

9. Register U.S. Apprenticeship Program (cont.)

Forms for Federally Managed States

The type of boilerplates an institution should fill out will depend on how it structures its apprenticeship program. (Note that an institution may need to start planning out the details of the apprenticeship program before it can determine the final structure; see Step 13 for more guidance). The boilerplates are generally the same for each type of program, but language and templates will vary slightly.

The DOL asks institutions to select the most appropriate boilerplate based on two factors: whether or not the institution works with intermediaries (e.g., a labor union or nonprofit organization), and how many employers are involved. Use the table below to determine the right form to fill out. (For readers reviewing a PDF of this publication, click the boilerplate name directly to be navigated to the appropriate online form.)

"My program will have..."	One employer	Two or more employers
One or more intermediaries (e.g., labor organizations or nonprofits)	Jointly Managed Single Employer Program	Jointly Managed with Multiple Employers Program
No intermediaries	Single Employer Program	Employer Consortia Program

Once an institution downloads the appropriate boilerplate, there will be several forms to fill out. Many of these forms simply ask an institution to sign off on the terms of registered apprenticeship programs. The most time-consuming forms will be the work process schedule and related instruction outlines. However, the guidance in Step 13 and through the aforementioned DOL Standards Builder should have already built these outlines for you.

Visit the **Department of Labor apprenticeship website** to ensure you are using the most current version of the boilerplates.

Source: Department of Labor, "Boilerplates"; Facilities Forum interviews and analysis.

10. Select a Training Partner

Step 10 is to determine how to provide classroom instruction. Most institutions rely on traditional training partners, such as community colleges, vocational schools, and unions. However, there is a growing number of nontraditional partners available, including online training programs.

The table below outlines a list of potential training partners. All types of talent development programs are able to partner with any training partner. However, each entry lists the benefits and challenges of working with a particular partner, as well as a successful case study from a higher education institution and online resources.

Talent Development Training Partners
(Listed from Most to Least Common)

Partner	Benefits	Drawbacks	Example	Resources
Vocational and Technical Schools; Community Colleges and 4-Year Colleges	Colleges and vocational and technical schools provide a structured curriculum, often with a hands-on component. Because the content has already been created, the timeline to launching the program can be shortened.	This partner usually requires in-person attendance, meaning options are limited by proximity. Even if there are colleges or vocational/ technical schools nearby, they may not offer coursework on required subjects.	The University of Virginia and University of Arkansas partner with local technical schools as part of their apprenticeship programs.	• U.S. community college partners: www.DOLeta.gov/oa/racc.cfm • Canadian college partners: www.itabc.ca/training-providers/overview
Unions	Unions have an existing relationship with the Facilities unit and already have training infrastructure in place. This training is typically free for union members, which most unions require apprentices to be.	Unions may have additional stipulations regarding apprentice/mentor ratios on campus or apprentice pay.	The California State University system works with the California public skilled trade employees union, SETC United, to run its apprenticeship program. Ohio University includes unionized employees on its apprenticeship program management staff.	U.S. institutions can find trade unions that provide apprenticeship programs on the AFL-CIO website: https://aflcio.org/about-us/careers-and-apprenticeships

Continued on following page

Source: California State University San Marco, San Marco, CA: Ohio University, Athens, OH: University of Arkansas, Fayetteville, AR; University of Virginia, Charlottesville, VA; Facilities Forum interviews and analysis.

10. Select a Training Partner (cont.)

Talent Development Training Partners (cont.)

Partner	Benefits	Drawbacks	Example	Resources
Nonprofit Organizations	Nonprofit organization partnerships are often low cost or free. Additionally, because nonprofits often focus on underserved populations, they have the ability to connect diverse community members with the institution, which can support institutional strategic aims.	Institutions are limited to the nonprofits in the region and/or ones that can provide distance education.	The Smithsonian Institution works with ABC Craftsmasters Training Trust (CTT), a 501(c)(3) (distinct from the union) that provides trades training for the Smithsonian's internal apprentices. CTT provides classes in 21 trades, including books, materials, lab supplies, and trained instructors.	CTT: www.abcmetrowashington.org/Career-Development/Apprenticeship-Skills-Training
Online Training Programs	Online training allows program participants to learn at their own pace and convenience (i.e., from any location). Additionally, institutions may save time if they are able to forgo coordination with a physical partner.	Format does not offer the hands-on, interactive learning environment of the classroom.	When in-person instruction was not readily accessible, the University of Georgia turned to online courses for carpentry apprentices. Georgia reached out to their DOL contact and received a list of approved online courses. The format was well received and apprentices responded very positively to the flexibility of online training. Lewis-Clark State College is piloting upskilling classes for their custodians and plans to record the classes and move the training online. They estimate the program will pay for itself with four to five students enrolled.	Career One Stop, website with online training courses: www.careeronestop.org/Videos/video-library.aspx

Source: Lewis-Clark State College, Lewistown, Idaho: Ohio University, Athens, OH; Smithsonian Institution, Washington, DC; University of Georgia, Athens, GA; Facilities Forum interviews and analysis.

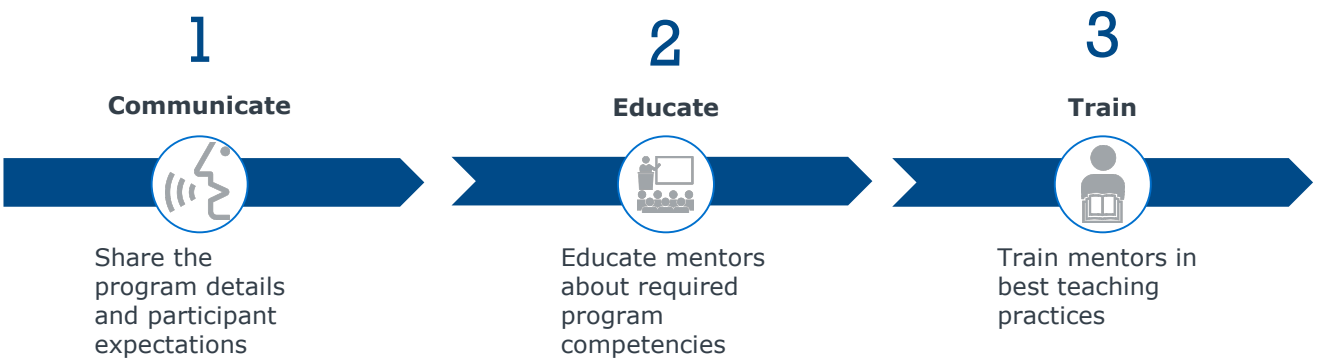
11. Select Mentor(s) to Lead On-the-Job Training

Step 11 is to select mentors to provide on-the-job training (OJT). Facilities leaders generally rely on their most tenured and experienced staff to serve as mentors. However, the greatest challenge is making sure that these staff members are also prepared to train new program participants. Not all experienced staff members are necessarily strong educators.

For example, the University of Arizona chooses mentors for its apprenticeship program based on how well they demonstrate the Facilities unit's leadership principles, which include accountability and treating others with respect. They are also considered on their ability to teach and their capacity for patience. Leaders found that even highly skilled technicians are not effective mentors if they do not have these qualities.

To ensure journeyworkers and other staff are prepared to train others, first communicate program details so that mentors understand what is expected of program participants. Next, ensure that mentors have a thorough understanding of the program competencies and are prepared to evaluate participants based on them. Last, if mentors require guidance for best training practices, use "train the trainer" resources to help prepare them, such as this one provided by the AFL-CIO.

Mentor Training Process



Source: University of Arizona, Tucson, AZ; Facilities Forum interviews and analysis.

12. Determine Required Competencies

Step 12 is to determine the required competencies for program participants. At their core, talent development programs are designed to help people master a predetermined list of competencies. In Canada, Red Seal has already outlined the required competencies to pass the exam and achieve journeyworker status in the major trades. In the U.S., however, Facilities leaders must determine which competencies participants are meant to master.

If a U.S. institution plans to register its apprenticeship program, it should use government guidelines to determine competencies. Alternatively, institutions can assemble a team to collaboratively select competencies. Senior facilities leaders, shop leaders, and experienced staff members in the relevant trade should contribute to the process. **This step outlines resources to help institutions build competencies lists for all three types of talent development programs, and also includes example competency lists.**

Apprenticeship Programs

The table below maps competency resources for the U.S. and Canada.

Country	Competency Resource	Description	Link
Canada	Red Seal	Canadian apprenticeship programs must use standardized competencies outlined by the Red Seal.	www.red-seal.ca
United States	O*NET OnLine	Online searchable tool that lists essential competencies, knowledge, and tasks for each trade.	www.onetonline.org
	U.S. Department of Labor Standards Builder	Interactive platform that guides employers toward the standards required for registered apprenticeships. (Even institutions not registering with a U.S. government agency can use this tool as resource).	www.DOLeta.gov/oa/registration/form.cfm

Additional apprenticeship competencies can be found steps 8 and 13 and online at eab.com/facilitiestalent.

Source: Facilities Forum interviews and analysis.

12. Determine Required Competencies (cont.)

Pre-Apprenticeship Programs

Skilled trades pre-apprenticeship programs need to incorporate both basic industry competency training (e.g., safety training, equipment, first aid) and competencies that are unique to the target population (e.g., math tutoring, ESL). Below are some typical competencies and requirements incorporated into pre-apprenticeship programs:

Workplace Readiness

- Understanding Facilities Management
- Understanding the apprenticeship path
- Goal setting
- Departmental or team budgeting
- Interviewing
- Career exploration
- Resume development
- Identifying and preventing sexual harassment and discrimination

Hands-On Experience

- Measuring
- Blueprint reading
- Hands-on trades training in a simulated lab experience

Safety

- Equipment safety
- Workplace safety
- OSHA[1] training and certification
- First aid
- Tool recognition and use

Math Skills

- Measuring
- Perimeter and area calculations
- Usage of fractions and decimals
- Numerical reasoning

Language Skills

- English speaking and writing for non-native speakers

1) Occupational Safety and Health Administration.

Source: Facilities Forum interviews and analysis.

12. Determine Required Competencies (cont.)

Formalized Upskilling Programs

Formalized upskilling programs do not require registration or accreditation and are therefore more flexible in their format. Institutions can determine their own goals and competencies depending on the needs of the Facilities unit and the expertise of the staff members who will likely participate in the program.

To begin, institutions with formalized upskilling programs recommend using the competencies of a parallel apprenticeship program as a basis. The list below outlines the competencies for the University of Colorado Boulder's pipes/mechanical trades formalized upskilling program.

Pipes/Mechanical Trades Intern at the University of Colorado Boulder

- Safety knowledge and procedures
- Technical knowledge required for a pipes/mechanical tradesperson
- Mechanical system knowledge, including HVAC systems, air compressors, steam, and refrigeration
- Perform inspections, minor repairs, and preventive maintenance procedures on HVAC equipment, mechanical equipment, and electrical rotating equipment
- Professional competencies:
  - Customer service skills
  - Attention to detail
  - Interpersonal skills
  - Communication skills
  - Collaboration
  - Reliability
  - Ability to work well within a team environment

Source: University of Colorado Boulder, Boulder, CO: Facilities Forum interviews and analysis.

13. Build Training Schedule

Step 13 is building out the schedule of activities that trainees will follow. This schedule maps out how participants will spend their time across both the on-the-job training and coursework components of the program. The instructions below provide guidance for designing a course schedule and work process schedule. Use the competencies determined by the Department of Labor or your institution as a basis for the content.

The first part of this step is creating a course schedule, if the program requires courses. To build a good course schedule, be sure to:

- **Designate class names and groupings** so program participants can understand where each class fits in the course progression
- **Preview course hours** so program participants can schedule ahead
- **Document the delivery method of the course** so program participants know if they will need to travel to classes

CLEMSON UNIVERSITY

Clemson University Course Schedule Excerpt

Course Grouping	Course Description	Total Time	Training Source
Plumbing Track	Diploma in Plumbing Studies	15 hours at own pace; complete within second semester	Alison Online
	Cross Connection/Backflow Certification	30 hours, two hours/week	South Carolina Department of Health and Environmental Control
	UE Systems[1] Level I Steam Trap Certification	15 hours, three hours/week	UE Systems

Designates class names and groupings

Previews total course hours and frequency

Documents course delivery method

1) UE Systems, Inc. is a company that specializes in ultrasonic instruments.

Source: Clemson University, Clemson, SC; Facilities Forum interviews and analysis.

13. Build Training Schedule (cont.)

The second part of this step is outlining work processes. Work processes include two items: the on-the-job training (OJT) program participants will receive (if applicable to your program) and the number of hours participants should dedicate to each type of OJT. To build an impactful work process document, be sure to:

- **Clearly list specific competencies** so participants know what they should learn
- **Include required hours corresponding with competencies** so participants can allocate their time
- **Designate the employee/mentor owning the training** for planning and auditing purposes; for example, the University of Arkansas's work process worksheet requires apprentices as well as their supervisors to sign off on their monthly training record. See an example on the next page.

UNIVERSITY OF ARKANSAS

Plumber Apprentice Work Process Training Schedule from the University of Arkansas

Process	Hours
1. Water/Sewer Mains Repair or Installation	500
2. Threading/Cutting/Welding	500
3. Sheet Metal/Ductwork	500
4. Piping Installation	1,500
5. Setting Fixtures	1,000
6. Service Work	1,000
7. Pumps	1,000
8. Test/Repair Backflow Preventers	1,000
9. Hydraulic Systems	1,000
TOTAL	**8,000**

Clearly lists specific competencies

Includes required hours corresponding with competencies

Source: University of Arkansas, Fayetteville, AR; Facilities Forum interviews and analysis.

13. Build Training Schedule (cont.)

Sample Work Process Worksheet from the University of Arkansas

Plumber Apprentice Monthly Work Process Worksheet

UNIVERSITY OF ARKANSAS

Name of Apprentice _____ Year of Apprenticeship_____

Employer _____ Month _____ Year _____

Hours Worked on Each Type of Operation

Day	A	B	C	D	E	F	G	H	I	J	K	Total
1												
2												
3												
4												
5												

Work Processes

A. Water/Sewer Mains Repair or Installation

B. Soldering/Brazing

C. Threading/Cutting/Welding

D. Sheet Metal/Ductwork

E. Piping Installation

F. Setting Fixtures

G. Service Work

H. Pumps

I. Test/Repair Backflow Preventers

J. Hydraulic Systems

K. Other

At the end of each month, the form should be checked to see that it is properly filled in with necessary signatures and turned in to the Foreman.

Shop Foreman _____

Apprentice _____

Journeyman _____

Source: University of Arkansas, Fayetteville, AR; Facilities Forum interviews and analysis.

14. Complete Necessary Program Documentation

Step 14 is to complete necessary program documentation. Most talent development programs require some amount of paperwork; this is particularly true for DOL-registered apprenticeship programs. Use this checklist to track common program and participant registration and administration forms. (Note that the program coordinator[s] will need to share this information with participants directly.)

Common Program Documentation Checklist (for Institution)

APPRENTICESHIP PROGRAM
FORM. UPSKILLING PROGRAM
PRE.[1]

- ❑ Program application
- ❑ Summary of compensation plan for HR approval
- ❑ Offer letters for approval from HR and Legal (these will likely differ from typical offer letters)
- ❑ Apprenticeship standards
- ❑ Job descriptions for job postings: **see following pages for examples**

Common Program Documentation Checklist (for Program Participants)

APPRENTICESHIP PROGRAM
FORMALIZED UPSKILLING PROGRAM
PRE- APPRENTICESHIP

- ❑ Program application
- ❑ Orientation packet
- ❑ Performance assessments (see Step 7)
- ❑ Course schedule
- ❑ Work process schedule (see Step 13)
- ❑ Job descriptions for job postings: **see following pages for examples**
- ❑ Time cards
- ❑ Apprenticeship standards and agreement (see Step 8)
- ❑ Apprentice grants and funding sources (see Step 6)

1) Pre-apprenticeship programs.

Source: Facilities Forum interviews and analysis.

14. Complete Necessary Program Documentation (cont.)

Documentation Example 1: Arizona HVAC Mechanic Apprentice Job Description

University of Arizona HVAC/Refrigeration Mechanic Apprentice

Purpose of Classification

This classification is used solely in conjunction with the University's registered Trades Apprenticeship Program for specific jobs in recognized trades. HVAC/Refrigeration Mechanic Apprentices are required to successfully complete a combination of a) on-the-job training and b) classroom work outside of the employee's normal work schedule during uncompensated time. During the four years of apprenticeship, incumbents are given progressively increasing levels of responsibility and are expected to increase their skills and productivity commensurate with their classwork and job experience. Apprentices work under the direct supervision of skilled journey level tradespersons to complete phases of work as required by the HVAC/Refrigeration Mechanic Apprentice Program.

Distinguishing Characteristics

This classification is not part of a series; however, this classification does encompass examples of duties to be assigned over the four year apprenticeship training program. Typical working conditions include restricted movement; dirty, hot, cold, dry, wet environments; and working with hazardous materials. Incumbents must be able to lift and carry heavy objects.

Example of Duties

YEAR 1: Performs unskilled and semi-skilled labor related to the installation, maintenance and repair of a wide variety of heating, ventilation, air conditioning and refrigeration systems and equipment. Runs errands, carries and delivers materials, tools, and equipment. Cleans/organizes tools, materials and equipment. Participates in HVAC/Refrigeration shop safety training. Maintains a clean and safe work environment. Operates university vehicles on and off campus (if applicable).

YEAR 2 ADDITIONAL DUTIES: Tests and inspects heating/ventilation/air conditioning/refrigeration systems for defects or areas of improvement. Performs basic installations of HVAC/Refrigeration systems. Monitors and interprets HVAC/Refrigeration gauges and instruments and learns to read mechanisms such as valves, systems and pumps to control level of fluid pressure and distribution in systems. Monitors and interprets HVAC/Refrigeration pressure temperature relationships. Reviews, interprets, and follows architectural drawings/blueprints, schematics, specifications and other technical documents related to the installation, maintenance, repair and removal of HVAC/Refrigeration equipment and systems.

YEAR 3 ADDITIONAL DUTIES: Examines, troubleshoots, detects and diagnoses defective HVAC/Refrigeration equipment, hardware or materials. Requests equipment and supplies for the purpose of maintaining inventory and ensuring the availability of required items. Develops plans to repair and/or replace defective HVAC/Refrigeration equipment, hardware or materials, obtains approval and proceeds with work. Performs independent work installing, maintaining and repairing HVAC/Refrigeration systems.

YEAR 4 ADDITIONAL DUTIES: Assists in designing and planning HVAC/Refrigeration systems, submitting plans to journey level HVAC/Refrigeration Mechanic for approval prior to commencing work. Reviews the work of others in maintaining and repairing HVAC/Refrigeration systems, and reports unusual situations to journey level HVAC/Refrigeration Mechanic. Solders, brazes and connects supply lines, air ducts and vents, refrigeration piping and pumps. Sizes duct work for proper airflow and system operation.

Knowledge, Skills, and Abilities

Knowledge of and skill in using basic math/algebra. Knowledge of basic HVAC/Refrigeration systems and controls. Ability to effectively communicate orally and in writing. Ability to read written materials, such as work instructions, safety procedures and material data safety sheets. Ability to follow oral and written instructions. Ability to work well in a diverse and team-oriented environment.

Minimum Qualifications

One year of experience working in construction, maintenance or other trades setting; OR, any equivalent combination of experience, training and/or education approved by Human Resources. Must be at least 18 years old.

Source: University of Arizona, Tucson, AZ; Facilities Forum interviews and analysis.

14. Complete Necessary Program Documentation (cont.)

Documentation Example 2: Arizona Electrician Apprentice Job Description

University of Arizona Electrician Apprentice Job Description

Purpose of Classification

This classification is used solely in conjunction with the University's registered Trades Apprenticeship Program for specific jobs in recognized trades. Electrician Apprentices are required to successfully complete a combination of a) on-the-job training and b) classroom work outside of the employee's normal work schedule during uncompensated time. During the four years of apprenticeship, incumbents are given progressively increasing levels of responsibility, and expected to increase their skills and productivity commensurate with their classwork and job experience. Apprentices work under the direct supervision of skilled journey level tradespersons to complete phases of work as required by the Electrician Apprentice Program.

Distinguishing Characteristics

This classification is not part of a series; however, this classification does encompass examples of duties to be assigned over the four year apprenticeship training program. Typical working conditions include restricted movement; dirty, hot, cold dry, wet environments; and working with hazardous materials. Incumbents must be able to lift and carry heavy objects.

Example of Duties

YEAR 1: Performs unskilled and semi-skilled labor related to the installation, maintenance and repair of a wide variety of electrical systems and equipment. Cleans/organizes tools, materials and equipment. Runs errands, carries and delivers materials, tools, and equipment. Participates in electrical shop safety training. Maintains a clean and safe work environment. Operates university vehicles on and off campus (if applicable).

YEAR 2 ADDITIONAL DUTIES: Tests and inspects existing electrical systems for defects or areas of improvement. Performs basic installations of electrical systems. Reviews, interprets, and follows architectural drawings/blueprints, schematics, specifications and other technical documents related to the installation, maintenance, repair and removal of electrical equipment and systems.

YEAR 3 ADDITIONAL DUTIES: Examines, troubleshoots, detects and diagnoses defective electrical equipment, hardware or materials. Develops plans to repair and/or replace defective electrical equipment, hardware or materials, obtains approval and proceeds with work. Constructs and/or assembles various types of electrical equipment. Performs independent work installing, maintaining and repairing electrical systems.

YEAR 4 ADDITIONAL DUTIES: Assists in designing and planning electrical systems, submitting plans to journey level electrician for approval prior to commencing work. Reviews the work of others in maintaining and repairing electrical systems, and reports unusual situations to journey level electrician.

Knowledge, Skills, and Abilities

- Knowledge of and skill in using basic math/algebra.
- Knowledge of and skill in using spreadsheet and word processing software.
- Ability to effectively communicate orally and in writing.
- Ability to read written materials, such as work instructions, safety procedures and material data safety sheets.
- Ability to follow oral and written instructions.
- Ability to work well in a diverse and team-oriented environment.

Minimum Qualifications

One year of experience working in construction, maintenance or other trades setting; OR any equivalent combination of experience, training and/or education approved by Human Resources. Must be at least 18 years old.

Source: University of Arizona, Tucson, AZ; Facilities Forum interviews and analysis.

15. Market Talent Development Program

Step 15 is to determine how to market your program. Facilities leaders and program staff must determine which strategies work best work for the institution. Most institutions focus on the benefits of participating in a talent development program, such as the certifications apprentices earn or the job prospects available after graduation. The list below provides a series of suggestions for your communications team to kick-start brainstorming.

Benefits of apprenticeships:

- Earn money while you earn your certification
- Lock in higher salary potential by completing an apprenticeship program
    - Registered apprentices in the U.S. on average make $240,000 more in a lifetime than their non-registered peers[1]
- Enjoy job security: skilled tradespeople are in high demand across many sectors
- Transition into full-time employment at the institution upon completion of your apprenticeship (this will vary by institution)

Benefits of pre-apprenticeships:

- Earn required certifications to jump-start entry into an apprenticeship program
- Gain hands-on experience and an introduction into the trades
- Begin a path to a higher salary as a certified trades professional

Benefits of formalized upskilling programs:

- Earn trades skills in a shorter amount of time than a full apprenticeship
- Advance your career and internal promotion at your institution

After developing talking points, start advertising to the audiences for whom you've crafted your message. Initially, institutions just launching programs may want to consider **traditional communication channels**. Use a variety of traditional advertising channels, such as newspaper and radio advertisements and print or online ads.

Alternatively, an institution can host **job fairs** for interested candidates, or attend regional fairs if the resources for an institutional fair are not available. To aid recruitment efforts, bring current or former apprentices or program participants who can talk to prospective applicants.

1) "An Effectiveness Assessment and Cost-Benefit Analysis of Registered Apprenticeship in 10 States."

Source: Facilities Forum interviews and analysis.

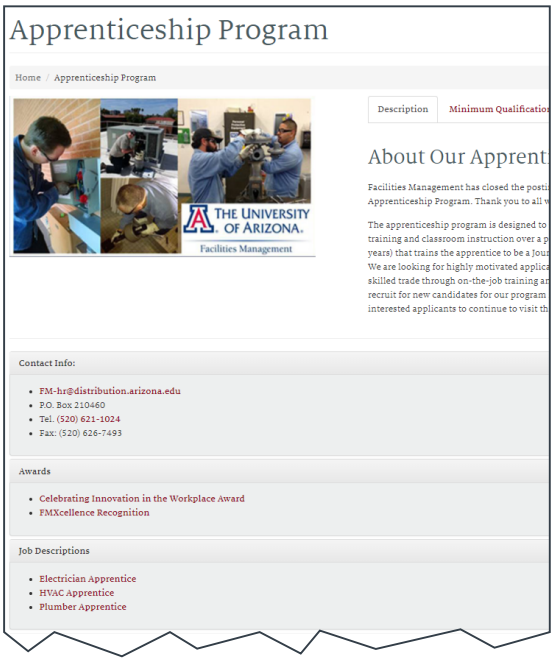
15. Market Talent Development Program (cont.)

Sample Apprenticeship Websites

A final practice is to create a **website** dedicated to your talent development program. Websites provide transparency and serve as an easily accessible recruiting tool. An online presence is particularly crucial for institutions with larger programs seeking to recruit four or more participants at a time. The University of Virginia and the University of Arizona use dedicated websites to promote apprenticeship programs, spotlighting FAQs and key selling points such as pay and growth opportunities. The websites also help the institutions recruit apprentices across multiple shops at the same time, lowering recruiting costs through economies of scale.

University of Virginia's Apprenticeship Website

University of Arizona's Apprenticeship Website



See the University of Virginia's Apprenticeship website here.

See the University of Arizona's Apprenticeship website here.

Source: "Apprenticeship Program" University of Arizona, Tucson, AR; "Facilities Management Apprenticeship Program," University of Virginia, Charlottesville, VA; Facilities Forum interviews and analysis.

16. Build Relationships with Recruitment Partners

Step 16 is to partner with organizations that can amplify recruitment efforts. Illustrating the benefits of trades programs to potential partners enables them to help source potential candidates. Larger apprenticeship programs have successfully partnered with local high schools. The University of Virginia (UVA) pulls most of its candidates from the three counties surrounding their institution. It maintains relationships by emailing every high school's guidance counselor and principal, allowing it to target trade classes within the school. It also holds meetings with local faculty and staff and obtain referrals from successful graduates of the program. UVA finds it can recruit students directly from high school this way; the University of Arkansas finds that students remember its in-school presentations and apply to the apprenticeship program years later when they're more mature and interested in a stable career.

The table below provides a list of potential recruitment partners who might help you reach candidates.

Potential Recruitment Partners

- Community colleges
- High schools
- Nonprofit organizations
- Department of Labor
- Military transition centers
- Internal facilities department
- State Workforce Centers

Use the following talking points when communicating with recruitment partners:

- "We are investing in the local community by supporting long-term workforce growth."
- "We serve and attract the best and brightest and provide them with secure job opportunities."
- "We offer pathways into some of the fastest-growing career tracks in the country."

Engage Current Program Participants to Recruit New Ones

- The University of Arkansas holds a potluck and chili cook-off during National Apprenticeship Week honoring current and past apprentices.
- The University of Virginia combines an annual apprentice graduation ceremony with a new apprentice induction ceremony, and families, campus stakeholders, and the media are all invited.

Source: University of Arkansas, Fayetteville, AR; University of Virginia, Charlottesville, VA: Facilities Forum interviews and analysis.

1 The Case for Investing in Facilities Talent Development Programs

2 Step-by-Step Guide for Launching In-House Talent Development Program

3 Case Studies of Talent Development Programs in Higher Education Facilities Management

California State University San Marcos

Background

Location: San Marcos, CA (pop. 61,980)

Type: Public

IPEDS Campus Setting: Suburb (large)

Student Population (full-time): 15,755

Total Campus Size: 304 acres

Facilities Management Union Status: Unionized

Apprenticeship Program

Year Founded: 2015

Department of Labor Registration: Yes, state

Graduates to Date: 50 (approx.)

For a sample CSUSM apprentice job description, visit eab.com/facilitiestalent.

Program Background

California State University San Marcos (CSUSM) launched an apprenticeship program in 2015. The CSUSM program is one of many across the CSU system, which entered into an agreement in 1990 with the skilled trades union, the State Employee Trade Council-United (SETC), to launch on-campus apprenticeship programs. This agreement was formalized in SETC's collective bargaining agreement. The program is centrally controlled from the CSU system chancellor's office by the Joint Apprenticeship and Training Committee (JATC), which is made up of representatives from both the union and CSU.

On each campus, the apprentice program is administered by a campus apprenticeship subcommittee, which has representation from both the SETC and campus leadership. Although the program is centrally funded and administered, there is latitude for each university to execute the program according to its own judgment, so long as its individual program meets the standards established by the 1990 joint agreement and approved by the California Department of Apprenticeship Standards (DAS). DAS standards govern apprentice wages, hours, and working conditions, the learning of skills, the length of the apprentice training, and requirements for classroom supplemental instruction. (Participation is optional and the program is not present on every CSU campus.)

When updating CSUSM's program, the senior Facilities officer (SFO) moved away from the online-based instruction implemented at other CSU universities. Instead, the SFO partnered with Associated Builders and Contractors, Inc. (ABC), a national construction industry trade association, to use its apprenticeship curriculum and classrooms. In its current form, CSUSM's program has a classroom component managed by ABC and on-the-job training completed at the university, providing apprentices with training in the HVAC, plumbing, and electrical trades. (Apprentices studying automotive equipment receive instruction at Palomar Junior College.)

Source: California State University San Marcos, San Marcos, CA; US News, "California State University-San Marcos"; Facilities Forum interviews and analysis.

California State University San Marcos (cont.)

Marketing, Recruitment, and Selection

Slots do not open up in CSUSM's apprenticeship program until a journeyworker-level vacancy is expected. Program administrators say one of the most difficult parts of the process is correctly predicting retirement rates and the accompanying vacancies.

When a slot does open up, staff may already have a particular candidate in mind (often within the custodial or groundskeeping). State regulations require the position to be publicly posted and open to all applicants who meet the requirements; for this reason, the Facilities department's HR unit often handles the initial marketing and recruiting. Staff members feel that having HR closely involved in hiring has greatly eased some challenges that might otherwise complicate the process.

Applicants must first pass a basic math exam to ensure they can perform calculations necessary to perform the jobs. Upon passing the exam, they begin panel interviewing with the CSUSM program hiring committee, which has representatives from the relevant shop, union representatives, and several senior facilities staff members. If a candidate performs well in the interviews and passes the university's standard background check, an offer is made.

Program Structure

WIKIMEDIA COMMONS.

Kellogg Library.

The CSUSM program is a four-year commitment. Apprentices have two components to their instruction: classroom learning, which is provided by ABC, and on-the-job training, which takes place on campus under the guidance of a designated mentor. The mentor, who is chosen by a senior facilities staff member that also sits on the program committee, is a role held by a journeyworker-level employee in a volunteer capacity. Notably, CSUSM treats the mentor-mentee relationship as an opportunity to develop not just the technical skills of the apprentice but also the leadership capacity of the mentor, ideally to help the mentor prepare for a managerial role in a shop or department. Some mentors are graduates of the apprenticeship program and bring this experience to their role; these have tended to be the strongest mentors, as employees who do not have that background have struggled with understanding the apprentice's role and how to best guide them. Although apprentices have a single mentor for the duration of the program, they have the opportunity to complete tasks under guidance of a range of journeyworker-level employees.

The competencies each apprentice is expected to master vary with the specialty and are set by the JATC standards that were approved by the DAS. (For a sample CSUSM automotive equipment mechanic job description, please visit eab.com/facilitiestalent.) In general, about 80% of time is spent on technical competencies and on-the-job training, 10% on maintaining records or other administrative tasks, and 10% on classroom training and program administration (e.g., evaluations).

Source: California State University San Marcos, San Marcos, CA; US News, "California State University-San Marcos"; Facilities Forum interviews and analysis.

California State University San Marcos (cont.)

Program Structure (cont.)

To successfully graduate from the program, apprentices must perform at a certain level in both the classroom and the on-the-job portions of the program. In the classroom, they must maintain a minimum GPA in their academic courses. Having a third party provide the classroom education and monitor apprentices' grades and accountability has greatly simplified performance monitoring.

During on-the-job training, mentors fill out a monthly feedback form, which they then go over with the apprentice. They discuss the apprentice's performance, making a note of any challenges that need extra attention to overcome. The feedback form is then passed to the apprentice's specific performance management committee. This committee is distinct from the hiring committee and has a different composition for each apprentice. It consists of a chair, who is a senior Facilities administrator; a second chair, who is another experienced Facilities administrator; a representative from SETC; the manager of the shop where the apprentice is training; the apprentice's mentor; and a representative from Facilities HR. The performance management committee reviews the feedback form and discusses it with the mentor. In addition to encouraging group accountability, the committee also ensures clear documentation in the event that an apprentice encounters serious challenges and cannot complete the program.

The various performance management committees also convene on a quarterly basis for a team evaluation of the apprentices, with all mentors, the apprenticeship program's chief union representative, and senior Facilities department leadership, discussing the apprentices' progress.

Once an apprentice has completed all four years of education and on-the-job training, they take the journeyworker exam in their trade and move on to a position within Facilities. There is no final exam or evaluation specific to the program. Because the program is centrally administered from the CSU system chancellor's office, the certificate that all graduating apprentices receive is from the chancellor, not from their specific university or from ABC.

Thanks to strong efforts to sell the union on the program's positive aspects, the CSU system enjoys a healthy apprenticeship program made possible by strong investment, both financial and educational, from the union. The CSU system also benefits from the scale of SETC's presence, which is large enough to contribute funding and staff hours to the program. However, this type of relationship may be difficult to implement in universities with small unions that can't afford to train apprentices.

Most senior program staff at CSUSM believe that the program would not be possible without enthusiastic union support. Program administrators credit this to a shared sense of accountability reinforced by the formalization of the apprenticeship program in the SETC's contract, as well as the equal division of representation at all system-level committees between university employees and union representatives. The union recognizes the symbiotic relationship, as the apprenticeship program allows the union to grow its membership as apprentices graduate and become university employees.

Source: California State University San Marcos, San Marcos, CA; WayUp, "Certified Automotive/Equipment Mechanic Apprentice"; Facilities Forum interviews and analysis.

California State University San Marcos (cont.)

Funding

Like the other CSU apprenticeship programs, San Marcos's program is centrally funded and the budget expands as the university grows. Program administrators have sometimes leveraged the program to their advantage as a way to ease in a new journeyworker position over four years, as this eases the financial impact compared to hiring a journeyworker and setting them to work. In this way, they can secure funding for the skilled positions they want in a way that is less impactful financially.

Pay Scale and Benefits

Apprentices are paid a starting salary of $3,671 per month upon entering the program.

Outcomes

CSUSM's program, which went through several incarnations before its current design, has graduated about 50 apprentices existence. Current administrators are focused on live classroom instruction and increasing department buy-in to graduate greater and greater numbers. Program staff also hope that some of the success they've experienced could be applied to other apprentice programs in the CSU system, particularly the implementation of the paper feedback forms and the focus on in-person training in both the classroom and on the job.

To further improve the quality of the program, CSUSM staff would like to implement a mentor training program in the future, possibly with union assistance.

Source: California State University San Marcos, San Marcos, CA; WayUp, "Certified Automotive/Equipment Mechanic Apprentice"; Facilities Forum interviews and analysis.

Northwestern University

Background

Location: Evanston, IL (pop. 74,895)

IPEDS Campus Setting: City (small)

Type: Private

Student Population (full-time): 21,823

Total Campus Size: 231 acres

Facilities Management Union Status: All are unionized, but formalized upskilling program has no union relationship

Apprenticeship Program

Year Founded: 2015

Department of Labor Registration: No

Graduates to Date: 18

Program Background

The Evanston Trades Program is jointly administered by Northwestern University and the city of Evanston, IL. It trains and hires racially diverse and/or female candidates who are typically not well represented in skilled trade applicant pools, diversifying the labor market in these professions while also creating a pipeline of younger workers.

The program is a collaborative effort between several divisions in the city government and university administration. In 2015, the city's Youth and Young Adult Division manager and the senior facilities officer at Northwestern came together to design a program in which Northwestern could benefit from the city's talent pipeline to diversify and de-age its workforce. In exchange, the city leverages Northwestern's educational resources to train young Evanston residents. The program's founders determined that they wanted to target workers who had the ability to commit to the job but were lacking the technical or professional skills necessary to enter the skilled trades. For this reason, the program lasts an entire year, which is a lengthy commitment at this level of assistance.

Marketing and Recruitment

The City of Evanston has several longstanding employment assistance programs, giving the city access to a robust pipeline of talented youth looking to acquire skills and work. Using the city's job-seeker network, as well as some local high schools that offer technical classes, the City of Evanston's program representatives handle recruitment. Many applicants report they heard about the program through word of mouth.

Source: Northwestern University, "Facilities Key Performance Indicators"; US News, "Northwestern University"; Northwestern University, Evanston, IL; Facilities Forum interviews and analysis.

Northwestern University (cont.)

Selection

Recruitment and selection of finalists is largely handled by the City of Evanston's Youth and Young Adult Division and Workforce Development program via the Evanston Trades Program Council, which has members from both the city of Evanston and Northwestern. Among Northwestern's members are the senior Facilities officer, the Facilities HR officer, shops representatives, and staff from Northwestern's Community Relations department. Once final-round applicants have been chosen, Northwestern takes over for the final selection process of trainees.

First, staff from Evanston's Youth and Young Adult Division and the Workforce Development program screen applicants for basic professional competencies determined by Northwestern, such as a willingness to learn and a courteous attitude. They also screen for a minimum level of technical competencies (depending on the trade involved). For example, a carpentry trainee may need to know some basic math. However, Northwestern has successfully admitted applicants of all different knowledge bases and is able to draw upon its resources and community relationships to support trainees if they need some assistance acquiring basic skills. Program administrators value a willing attitude and an eagerness to learn over "hard" skills, which can be taught during the program.

The City of Evanston and the board then complete the first round of selections, culling the applicant pool down to a smaller pool of final candidates, who are then interviewed by Northwestern. From the interviewees, six candidates are selected each year. To date, all of the recruits have been African American and two have been women.

Program Structure

The Evanston Trades Program is a one-year program. Once accepted, applicants initially can explore multiple trades, and then work with program supervisors to choose a shop to specialize in. They receive daily training and shadowing opportunities with senior staff.

In the program's current incarnation, Facilities HR staff handle the day-to-day administration of the program, while Facilities leaders, university operations, and HR share responsibility for long-term planning. HR's role is relatively recent, dating only to the program's third year when Facilities leaders worked with their HR staff to have the necessary resources in place for trainees before the program kicked off (e.g., iPads, tools, uniforms). Northwestern reports that working closely with HR has been a huge boon for the program; among their contributions, HR staff hold regular check-ins with the trainees to measure progress and solicit feedback about the program. HR is also equipped to communicate with the trade unions, shop heads, and other university divisions, making them an ideal central nexus for program administration.

Northwestern's shop heads are in charge of the trainee's instruction during the program. They also track trainees' competencies, oversee training activities, and pair trainees with different journeyworkers so that they develop a broad knowledge base. Training mostly consists of observation and shadowing, as well as occasionally completing tasks with a senior staff member's guidance.

Source: Northwestern University, Evanston, IL; Facilities Forum interviews and analysis.

Northwestern University (cont.)

Program Structure (cont.)

For the first cohort, trainees were given a choice of placement in either the paint or carpentry shops, two areas where Northwestern needed more talent. At the program's conclusion, four of the six trainees were hired as utility workers or as "helpers," a new position created at the bottom of the union's hierarchy ladder so that trainees could be paid employees despite not having a skill set that was commensurate with existing union job descriptions. Northwestern assisted the two remaining trainees with finding opportunities and preparing for interviews, and both were hired elsewhere.

Entering year two, a major component of feedback was that trainees desired more trade-specific training. In response to this, the second cohort of trainees rotated through different shops throughout the year. They spent three to four months in plumbing, electrical, engineering, and central plant. At the end of the year, the program's board met and determined which trainees would be hired in which shops. All six trainees were hired into one of the trades.

One shortcoming of the rotation model was the shortened period of time trainees spent in each shop, which did not sufficiently prepare them for an entry-level job. To correct for this, trainees in the third cohort and later were able to do shorter, one-month shop rotations at the beginning of the year. Then, they picked a specialty and stayed there for the remainder of the year. Both staff and trainees feel this arrangement is the ideal balance of time between exploring the different trades and having sufficient time to learn new skills.

To supplement skills training, leaders have added nontechnical training to the curriculum. Trainees now receive instruction in basic work skills and also take six courses on financial literacy through a local bank.

To ensure trainees feel comfortable asking even basic questions like how to use tools or take measurements, Northwestern relies on supervisor recommendations to select mentors to ensure that they are both technically competent and genuinely invested in their trainee's growth.

In years one and two, trainees were evaluated holistically on nontechnical skills, such as their work ethic. Beginning in the third year, technical aptitude assessments were added.

> "This is a people project. The staff that have joined us as part of this program are some of our strongest staff."
>
> *Christina Sanborn, Associate VP of Facilities Management*

Cost and Financing

The program is funded by Northwestern's central administration via Northwestern's Office of Neighborhood and Community Relations. When trainees join, they become one-year contract employees of the university and receive standard benefits. If the trainee is hired, his or her salary and benefits are covered by the Facilities budget. As a result, current vacancies and the annual budget partially dictate how many trainees get hired and where they go. Since trainees graduate with only one year of training, they are eligible only for entry-level positions; by comparison, most vacancies are for upper-level positions. When the department has a budget surplus, they can create new entry-level positions for the graduates. In times when this is not a viable option, Northwestern commits to helping all trainees find employment, inside or outside the university.

Source: Northwestern University, Evanston, IL; Facilities Forum interviews and analysis.

Northwestern University (cont.)

Outcomes

Northwestern reports the program has achieved its three goals: 1) improving the university's relationship with the city of Evanston; 2) providing Evanston's underserved residents with job training; and 3) supplying the Facilities department with committed, diverse staff.

The university ultimately hired ten of the twelve graduates to date (four from the first cohort and all six from the second); trainees not hired secured jobs elsewhere. Given the strength of employees hired from the program, Northwestern's senior Facilities leaders have expressed an interest in someday starting both a formal apprenticeship program and a similar training program focusing exclusively on women.

As the university has addressed its most severe labor shortages, Northwestern plans to adjust either the size or the frequency of the program moving forward.

WIKIMEDIA COMMONS.

University Hall.

Source: Northwestern University, Evanston, IL; Facilities Forum interviews and analysis.

University of Alberta

Background

Location: Edmonton, Alberta, Canada (pop. 928,182)

Type: Public

Student Population (full-time): 38,311

Total Campus Size: 230 acres

Facilities Management Union Status: Unionized

Pre-Apprenticeship Program

Year Founded: 2007

Graduates to Date: approx. 100

Program Background

The University of Alberta's a pre-apprenticeship program is a partnership with a local nonprofit, Careers: The Next Generation (CNG). CNG's mission is to encourage high school students who are at high risk of dropping out or not pursuing postsecondary education to begin training for technical careers through apprenticeships and other programs while still in high school. To accomplish this, CNG partners with entities that can provide skilled trades training through its Registered Apprenticeship Program (RAP).

After doing a demographic survey of the current tradespeople at the University of Alberta, Facilities leaders recognized that the majority of skilled employees were within ten years of the retirement age threshold. Leaders began to discuss how to create a talent pipeline with shop supervisors. Although they encountered some initial reluctance from supervisors who perceived starting a program from scratch as potentially burdensome, supervisors eventually recognized that the benefits outweighed potential issues. Discussions were also held with the university's trade unions to make sure they were satisfied with the conditions for employment.

Marketing and Recruitment

CNG typically targets 11th-grade students, recruiting them to work for a semester or two at the University of Alberta. The program directs students into the trades where they are understaffed. Most candidates hear about the program through word of mouth.

Selection

Once RAP has selected the students, the University Alberta completes the interview process and shop supervisors choose the final participants. The university typically selects five to ten students each year (although in the program's early years, there were as many as eighteen).

Source: University of Alberta, Edmonton, AB; Facilities Forum interviews and analysis.

University of Alberta (cont.)

Program Structure

The program begins each year in summer. As the program is not a formal apprenticeship, the training is limited: students spend much of their time helping with minor tasks or observing journeyworkers. The program works to supplement this with meaningful mentorship and a personalized focus on each apprentice. The shop supervisor and foreperson manage day-to-day operations in each shop. Supervisors also conduct evaluations for each student (with input from the journeyworkers with whom they have worked).

Working with high school-age students can present a unique challenge for staff, as the students have less work and life experience than older apprentices. One manager described how staff try to look upon students like their own children. They do their best to guide the students through what can be a daunting time. The program emphasizes patience in its instructors and chooses its journeyworker mentors carefully. Alberta reports that the most successful pre-apprentices finish the program with a demonstrated interest in returning Alberta as a full-fledged apprentice or journeyworker.

Students who complete the program and graduate from high school can count the program as five months of experience. The program requires that students graduate from high school to earn credit toward an apprenticeship from their time at Alberta. According to program administrators, this provides the students with an incentive to finish school, as well as attractive experience once they graduate school and seek a true apprenticeship.

> "The private sector doesn't want to invest in workers. But if you invest in them, then they'll invest in you. When you get that, you can't ask for anything better."
>
> *Tony Maltais, Director, Building Information Infrastructure & Analytics*

Pay Scale and Benefits

The program's participants can earn up to CAD$18 or $20 per hour working for Alberta, which is nearly double the minimum wage for the area. The generous salary also serves as a valuable example of how much money journeyworkers can command within the skilled trades, enforcing that this is a worthwhile career path and an occupation that can give them a comfortable lifestyle once they have completed training. The university and nonprofit decided to institute a probationary period for the first two weeks of the program each year, during which the students are not required to be paid.

Cost and Financing

The program is financed through Facilities' existing operating budget, with some supplemental funding from projects that students work on. Facilities can also issue chargebacks for program participants at a reduced rate, which leaders feel is commensurate with their experience level.

Source: University of Alberta, Edmonton, AB; Facilities Forum interviews and analysis.

University of Alberta (cont.)

Outcomes

Two apprentices are currently enrolled through the RAP program, both specializing in electrical work. Alberta has hired at least 30 apprentices as full-time employees after they finished the program and graduated from high school, though many more students have been interested in working at the university. (Program staff often encourage students work for another employer first, such as a private contractor, to gain more experience.)

Program administrators are frank about the payoff that a dedicated student can reap with a few years of intense training—by starting their apprenticeship in high school and continuing directly after graduation, a student can be a licensed journeyworker by age 21 and command a salary of up to CAD$80,000 per year. They can gather more than a decade of experience by the time they are 30 and begin assuming even higher-paying supervisory roles.

Program staff report that the program's greatest contribution has been to provide a pipeline of personally invested and loyal young talent. A high percentage of the apprentices that pass through the program express a desire to stay and work at Alberta, and those that the university does hire demonstrate strong dedication to Alberta.

Source: University of Alberta, Edmonton, AB; Facilities Forum interviews and analysis.

University of Arkansas

Background

Location: Fayetteville, AR (pop. 82,800)

IPEDS Campus Setting: City (small)

Type: Public

Student Population (full-time): 27,194

Total Campus Size: 718 acres

Facilities Portfolio: 4.5 million GSF

Facilities Management Union Status: Not unionized

Apprenticeship Program

Year Founded: 1973

Department of Labor Registration: Yes, state and federal

Graduates to Date: approx. 115

For a sample training schedule for a boiler mechanic apprentice, visit eab.com/facilitiestalent.

Program Background

The University of Arkansas's program began in 1973, making it one of the oldest apprenticeship programs in higher education Facilities Management. While the program initially focused on general skills, with placement in a trade coming only after graduation, it has been revamped to focus on specific trades. Now, apprentices are placed in a specific trade at the start of the program; if they complete the program within four years, they will be placed in an open position within their trade.

Though the program is open to both internal and external applicants, the vast majority of apprentices are current Arkansas employees. The program currently focuses on training apprentices in carpentry-locksmithing, HVAC, plumbing, standard electrical, and high-voltage electrical supply trades, although it has offered other specialties in the past depending on department vacancies and the availability of journeyworkers to mentor apprentices.

Marketing, Recruitment, and Selection

As the vast majority of Arkansas's past apprentices were internal hires who worked in grounds, labor shop, maintenance, and custodial services, the program initially did minimal marketing. Now, positions are marketed in the same way as all university job openings according to school-wide policy—they are advertised internally within the university's applicant tracking system and externally on the Arkansas career site. However, program staff rely mostly on internal department knowledge of prospective applicants to make a decision.

All applicants must have a high school diploma or GED and a valid driver's license. To work for Arkansas, apprentices must pass a background check, drug test, and an investigation into any history of sexual misconduct, which aligns with the university's employment qualifications and which current employees have passed. Some mechanical experience is beneficial but not required.

Source: University of Arkansas, Fayetteville, AR; University of Arkansas, "Fayetteville Policies and Procedures 401.0," https://vcfa.uark.edu/policies/fayetteville/hmrs/4010.php; Facilities Forum interviews and analysis.

University of Arkansas (cont.)

Marketing, Recruitment, and Selection (cont.)

Arkansas's apprenticeship program is governed by an Apprenticeship Council, a six-member body made up of three skilled trades representatives and three members chosen by the associate vice chancellor for facilities. The Facilities department's HR supervisor and the apprenticeship coordinator serve as a nonvoting seventh and eighth members on the Council, handling organizational and processing needs. The apprenticeship coordinator holds the position in a part-time capacity, in addition to their other duties; the current coordinator is a project manager in the Construction Services division. The Apprenticeship Council oversees the application process by collecting paperwork, administering evaluations, and finally passing suitable candidates to the shops to interview. The Apprenticeship Hiring Committee then makes recommendations for hiring to the Council. The associate vice chancellor for facilities has final approval of hires.

Program Structure

The program is primarily administered by the Apprenticeship Council. It is also supported by the Joint Apprenticeship Committees (JACs), which are shop-specific entities that function as liaisons between the program's directors and frontline staff. There is one JAC for each skilled trade shop on campus, comprising the shop foreman and a shop representative. As technical experts in the trade in which apprentices are training, the JACs report to the council on apprentices' progress and maintain records for the apprenticeship program in their shop.

Apprentices complete 8,000 hours of on-the-job training over four years, working a 40-hour work week. This training begins at a mostly observational level in the first year, progresses to performing minor work with supervision in the second year, and more advanced work in the third and fourth years. Apprentices are expected to graduate from the program able to perform journeyworker-level work in their trade unsupervised. They must also complete a minimum of 144 hours of classroom technical instruction each year.

By the end of the program, apprentices are expected to have mastered all of the proficiencies listed in the Apprentice Standards document created by the university and approved by the state and federal Departments of Labor. For a sample training schedule for a boiler mechanic apprentice, with a breakdown of these proficiencies over the course of the 8,000 hours, visit eab.com/facilitiestalent.

While completing their on-the-job training, apprentices are paired with a journeyworker in the shop, whom they shadow and learn from. The program's standards require a ratio of one apprentice to one journeyworker. The journeyworker mentor changes regularly so that apprentices get exposure to a variety of different teaching and working styles. For the same reason, apprentices also rotate among different worksites and types of work whenever possible, such as moving from a construction shop to a campus maintenance zone.

Source: University of Arkansas, Fayetteville, AR; Facilities Forum interviews and analysis.

University of Arkansas (cont.)

Program Structure (cont.)

Because Arkansas's program is registered with both the state and federal Departments of Labor (DOL), apprentices receive a certificate of completion from the DOL at graduation. Staff believe that this certificate, which has the Department seal on it, adds a sense of gravitas to the program and is attractive to applicants. The registration process was completed simultaneously at the state and federal levels, as all federally registered programs are also recognized by states. The program administrators completed a template of program standards listing out program structure, apprentice competencies, generally demonstrate compliance with DOL standards. However, there is room to negotiate DOL requirements; for example, the federal government mandates that apprentices receive a raise after six months of work; however, since the university could not raise their wages before less than one year, the Facilities department negotiated with the DOL to offer annual raises instead.

Many of the program's journeyworker mentors are graduates themselves, including the program's apprenticeship coordinator. Because many of the staff responsible for managing and teaching the apprentices once experienced the same training, there is a strong sense of camaraderie within the department, which contributes to effective instruction and high retention rates after graduation.

Apprentices attend classes at several local community colleges and technical schools, including Northwest Arkansas Technical Institute.

Pay Scale and Benefits

Arkansas's program has a tiered pay structure, with pay increasing at the end of each year. Each trade's salary accounts for differences in skill levels and industry standards, but all salaries increase by a set proportion each year until the apprentice is making a standard journeyworker wage by the end of their fourth year. The table below offers a representative pay scale:

Year 1	Year 2	Year 3	Year 4	Journeyworker Salary
$20,000	$28,000	$32,800	$35,680	$40,000

Participating in the program requires some employees, such as custodians, to take a pay cut when they start, as the starting salaries for apprentices are lower than that what they are currently paid. However, because the tiered pay scale means that salaries increase annually, the lower starting salary is not a deterrent—accepted applicants can expect to graduate with a higher salary than they currently earn. Nevertheless, state-mandated salary caps mean that Arkansas does not always offer competitive salaries relative to private industry.

Apprentices work a standard 40-hour workweek. They are not compensated for classroom time.

Source: University of Arkansas, Fayetteville, AR; Facilities Forum interviews and analysis.

University of Arkansas (cont.)

Cost and Financing

Arkansas estimates the program costs $4,000 to $8,000 per year, depending on the number of apprentices enrolled. Each apprentice costs the department $1,000 to 2,000 per year, which goes toward books, tuition, or any other necessary materials (not including a salary for the apprentice).

The program is mostly funded through the Facilities budget, which generates revenue through chargebacks (i.e., work completed by Facilities staff at cost to the academic or administrative unit). In recent years, Arkansas has turned to state grants to subsidize the cost of the program. The state government offers grants to support skilled trades apprenticeship programs. As of late 2018, Arkansas has secured $100,000 in grants to increase its number of apprentices.

Outcomes

There are currently two apprentices enrolled in the program, one in Electrical and one in Carpentry.

Upon graduating, apprentices receive an official certificate from the DOL, which makes them eligible to sit for the state licensing exam in their trade and become a journeyworker. They are also guaranteed to be hired as a journeyworker in the Facilities department, should they choose to remain at the university. (For this reason, the department never accepts new apprentices into the program unless it can guarantee a job opening in four years.) More than 90% of the graduates have chosen to remain at Arkansas. Program staff feel that this institutional loyalty is one of the program's most valuable intangible benefits.

Arkansas's program has graduated roughly 115 apprentices, many of whom still work at the institution. According to Arkansas's website, as of late 2017, more than 80 apprentices have graduated from the program and joined the Facilities department since its founding.

Trade	Number of Apprentices Who Graduated and Joined Arkansas Staff
Electrical	23
HVAC	19
Plumbing	15
Carpentry	9
Painting	6
Environmental Compliance	4
Welding[1]	2
Sheet Metal Fabrication	2
Hazardous Materials	1
Locksmithing[1]	1
Brick Masonry	1
Electronic Engineering	1
TOTAL	84

Website

https://fama.uark.edu/apprenticeship.php

1) One graduate received dual certifications in Welding and Locksmithing.

Source: University of Arkansas, Fayetteville, AR; Facilities Forum interviews and analysis.

University of Colorado Boulder

Background

Location: Boulder, CO (pop. 108,090)

IPEDS Campus Setting: City (midsize)

Type: Public

Student Population (full-time): 33,977

Total Campus Size: 600 acres

Facilities Portfolio: 7.7 million GSF

Facilities Management Union Status: Not unionized

Formalized Upskilling Program

Year Founded: 2014

Department of Labor Registration: N/A

Graduates to Date: 3

For CU Boulder's Pipe-Mechanical Trades I Competencies list, visit eab.com/facilitiestalent.

Program Background

In recent years, the University of Colorado Boulder has struggled to recruit skilled tradespeople. As a result, CU Boulder's vacancy rate has crept up to 6%, and leadership expect it to keep growing (particularly for trades like building controls technicians). Complicating CU Boulder's search for skilled trades is the state's Labor, Trades, and Crafts Occupational Group's level designations, which mandate that all workers applying to level I skilled trades positions have at least two years of experience working within the trade already. This requirement creates a skill gap, where inexperienced workers struggle to gain the experience required for an entry-level position.

To address this, CU Boulder has develop a Pipe/Mechanical Trade Labor Trades and Crafts (LTC) Trainee Program, a formalized upskilling program targeting current employees in the custodial, dining services, or grounds divisions. The LTC Trainee Program was created by CU Boulder's Low-Wage Earner Task Force Committee, whose stated mission is to increase the earnings of university employees currently making less than $15 per hour through employment training. Following the recommendation of the Committee, CU Boulder's CFO designated central funds to create the program, funding three trainee positions per year for the next four years, for a total of 12 employees. CU Boulder created its own formalized upskilling programs rather than pursuing a traditional apprenticeship program through the Department of Labor because of state regulations on apprentice pay; mandated increases would require salaries beyond what CU Boulder is currently budgeted for. This is also the reason that the university focuses on the pipe/mechanical trades, rather than on plumbing or electrical trades, as pipe/mechanical positions do not require licenses.

Source: US News, "University of Colorado Boulder"; University of Colorado Boulder, Boulder, CO; Facilities Forum interviews and analysis.

University of Colorado Boulder (cont.)

Cost and Financing

The program is centrally funded by CU Boulder. The budget covers employment for each trainee during and after the program at a salary of $2,864 per month. In the program's current model, the difference between the salary at which a trainee is funded for the duration of the program and their finishing salary ($3,260 per month) has resulted in a funding gap that administrators have discussed remedying through chargebacks.

Pay Scale and Benefits

Trainees are paid $2,864 a month for the duration of the program. If an accepted applicant enters the program earning more than $2,864 per month, they are paid their current salary. Upon promotion to a Pipe/Mechanical Tradesperson I, they receive a raise to $3,260 per month, which is commensurate with the salary for a Level I position.

Marketing and Recruitment

Because the program exclusively targets CU Boulder employees, Facilities does not market the program extensively. Instead, they can fill the program relying mostly on word of mouth and announcements at department meetings.

Selection

Applicants are not required to have any experience as the program's purpose is to train them for entry-level positions in pipe trades. Prospective trainees must be current CU Boulder employees in either Facilities Management or Housing and Dining Services and must possess a valid driver's license. All applicants undergo a criminal and motor vehicle background check.

In the program's initial cohort, 30 employees applied. Program leadership narrowed down that pool to nine finalists, who were interviewed by the shop supervisors. Since the program does not require any technical experience, the interviewers instead focused on asking interpersonal questions to gauge applicants' willingness to learn, ability to work in a team, and other "soft" skills. Three were selected.

Program Structure

The program is structured around a book of proficiencies in the trade, which was created by shop supervisors and program administrators after brainstorming what skills would be required of someone entering the shop. Each trainee receives a copy of this book, which has prompts for supervisors to sign off on completion. When a trainee has mastered a proficiency, the supervisor observes the performance of the relevant task and confirms completion in writing.

WIKIMEDIA COMMONS.

Wolf Law Building.

Source: University of Colorado Boulder, Boulder, CO; Facilities Forum interviews and analysis.

University of Colorado Boulder (cont.)

Program Structure (cont.)

Sample Competencies for Pipe-Mechanical Trades I
A full PDF of this resource is available at eab.com/facilitiestalent.

1. Safety
2. Mechanical Systems
3. Rigging
4. Personal Protective Equipment
5. Ladder Safety
6. Chemical Safety
7. Hearing Conservation
8. Lockout/Tagout Procedures
9. Basic Emergency Procedures
10. Respirator
11. Construction Site Access
12. Proper Tie-Off Procedures
13. Material Safety Data Sheets
14. Basic Electrical Safety

Trainees work 40 hours per week, during which they are paired with a technician to observe. Trainees are often paired with an experienced journeyworker to complete preventative maintenance tasks, which helps them build the necessary competencies for the level I and II tradesperson roles. As their knowledge grows, trainees take on supervised solo tasks. The supervising technician provides feedback to the trainee during hands-on work and provides summaries of the trainee's progress to the shop supervisors. Senior shop employees regularly provide feedback to the trainees as well, using the performance management protocol established for all CU Facilities employees.

Trainees complete the proficiency book by the end of the year and receive a final test from their shop supervisor. The supervisor verbally quizzes them on the meaning of technical terms and asks them to walk through the steps for solving various hypothetical problems. Upon passing the exam, trainees are promoted to a level I pipe/mechanical tradesperson and assume duties in the shop. All trainees who successfully complete the program are guaranteed employment with CU Boulder.

Outcomes

While the trainee program has only just finished its first year, all trainees in the first cohort successfully moved into Tradesperson Level I positions.

Source: University of Colorado Boulder, Boulder, CO; Facilities Forum interviews and analysis.

University of Massachusetts Amherst

Background

Location: Amherst, MA

Type: Public

IPEDS Campus Setting: Suburb (large)

Student Population (full-time): 30,340

Total Campus Size: 1,463 acres

Facilities Management Union Status: Unionized

Apprenticeship Program

Year Founded: 2005

Department of Labor Registration: Yes, state

Graduates to Date: 8 (approx.)

For supporting documents from UMass Amherst's program, visit eab.com/facilitiestalent.

Program Background

The University of Massachusetts Amherst (UMass Amherst) created its apprenticeship program in 2005 in response to abnormally high vacancy rates and a wave of retirements. The first batch of apprentices trained to fill vacancies in electrical, plumbing, HVAC, and dig-safe units. As UMass Amherst is a highly unionized environment, the program's founding committee involved union leadership from the beginning, including designing the program. Facilities also established a labor management committee to collaborate on the university's collective bargaining agreement and generally increase the union's involvement in administering the program.

Marketing and Recruitment

Although the program is open to all qualified candidates, most candidates come from entry-level roles in Facilities. Notices are posted on internal job boards and electronic job websites, as any university position would be. As UMass Amherst is highly unionized, the union has a hand in recommending internal applicants.

While UMass Amherst's robust cooperation with its union has shaped the applicant pool until now, the Facilities department has recognized that this has also limited the program's diversity. Administrators are currently exploring other avenues of recruitment that both appeal to the union while also expand the pool of applicants to better include underrepresented demographics. This includes considering a partnership with local pre-apprenticeship programs and possibly establishing a pre-apprenticeship pipeline into the program through the department's own custodial division.

To avoid training apprentices without a job opening, UMass Amherst recruits apprentices only if there is an urgent need for a new journeyworker or a current employee's retirement is expected. Program administrators report that trying to predict the retirement schedules of senior employees is one of the most difficult aspects of running the program.

Source: US News, "University of Massachusetts—Amherst"; University of Massachusetts Amherst, Amherst, MA; Facilities Forum interviews and analysis.

University of Massachusetts Amherst (cont.)

Selection

After the application period closes, the program coordinator reviews each application. The coordinator is a member of the program's governing body, the Joint Apprenticeship Committee, which contains representatives from the labor union, shops, and Facilities leadership. The coordinator works to collect and screen applications, organizes testing and interviews, and collaborates with the DOL to fulfill federal and state requirements for the application and selection process.

The various components of the application and interview process are weighted and scored, resulting in a total candidate score of 1 to 100. As part of the application process, candidates take an evaluation to gauge their capacity for abstract mechanical reasoning. Applicants must score at least 70% on this test to qualify for the program, which counts for 30% of the total candidate score. Previous work experience, the applicant's interest in and willingness to perform the work required in the apprenticeship, and the applicant's relative seniority are also weighted in the score. The committee then completes in-person interviews with finalists, which are the final score component.

A sample UMass Amherst application for an apprentice and an example of selection criteria can be found at eab.com/facilitiestalent.

Program Structure

There are currently two apprentices enrolled in the program. Due to the small size and specialized nature of each cohort, apprentices work closely with a licensed journeyworker to complete their training, with shop supervisors assisting. Apprentices complete approximately 600 hours of classroom and instruction-based training and 8,000 hours of on-the-job training under the guidance of a journeyworker or supervisor. UMass Amherst developed competencies for each specialty using templates from the Massachusetts DOL, which the university modified and sent back for approval.

In addition to overseeing the recruitment and selection process, the apprenticeship coordinator also oversees the day-to-day administration of the program. The coordinator works from a document known as the "master sheet," which is adapted from the DOL-approved competencies list and includes additional information to monitor the progress of each apprentice. The coordinator meets regularly with each apprentice and supervisor and is in charge of generally assessing each apprentice's progress and maintaining the necessary records with the DOL. The coordinator also provides logistical support, such as registering apprentices for classroom instruction.

Progress is formally tracked in each apprentice's work-record book, where required competencies and coursework are listed and checked off. If an apprentice is behind in mastering his or her required competencies, the coordinator alerts the apprentice and works with his or her supervisor to create a recovery plan. If the apprentice does not progress, he or she may be dismissed from the program.

A sample competencies list, master sheet, coursework requirements list, and four-year work schedule for a UMass Amherst apprentice can be found at eab.com/facilitiestalent.

Source: University of Massachusetts Amherst, Amherst, MA; Facilities Forum interviews and analysis.

University of Massachusetts Amherst (cont.)

Salary and Benefits

Apprentices are paid according to a schedule that increases annually, culminating in a salary equivalent to an entry-level journeyworker after graduating. Apprentices are all union employees and have the cost of union dues subtracted from their salary.

Cost and Financing

The program is currently financed through vacant salary lines, although administrators are working to secure central funding for future cycles. Excluding apprentice salaries, the program costs approximately $15,000 per apprentice per year, which is a combination of administrative costs and classroom tuition.

Outcomes

Roughly two-thirds of the applicants that UMass Amherst accepts ultimately graduate; the remaining one-third drop out or are asked to leave the program. Program administrators attribute this attrition rate to the challenging nature of the program, particularly in mechanically complex trades.

All of the graduates who successfully complete the program have been hired by UMass Amherst. In certain situations, the hiring of some apprentices was contested by the union and the department was forced to hire a second worker from within the union for the same position being filled by the apprentice. The department feels that this tension may be eased in the future, as the union has grown steadily more supportive of the apprenticeship program and increased its involvement, which may lead it to be more support of hiring graduates instead of external hires who have been union members for a longer period of time.

Source: University of Massachusetts Amherst, Amherst, MA; Facilities Forum interviews and analysis.

University of Virginia

Background

Location: Charlottesville, VA (pop. 47,000)

IPEDS Campus Setting: Suburb (small)

Type: Public

Student Population (full-time): 27,400

Total Campus Size: 1,682 acres

Facilities Portfolio: 17 million GSF

Facilities Management Union Status: Not unionized

Apprenticeship Program

Year Founded: 1982

Department of Labor Registration: Yes, State

Program Background

UVA's apprenticeship program dates back to 1982 and trains apprentices in the electrical, HVAC, plumbing, carpentry, and plastering trades. It was the first program of its kind established by a state agency in Virginia. UVA's Facilities division launched the program because leaders recognized they would soon face a skilled trades shortage. Most concerning, because the Facilities department manages both the academic campus and medical center, Facilities leaders were concerned with the lack of options for tradespeople to train in the university's complex equipment. Leaders reached out to several local technical schools and community colleges to begin a formal apprenticeship program where students could take classes at the technical schools and get practical training at UVA.

Marketing and Recruitment

UVA has a well-established pipeline within local high schools. As a result, apprentices generally come from the surrounding counties. The relationships have been built up over the years through meetings with faculty and staff, regular communication with the schools' guidance counselors and principals inquiring about promising candidates (such as students currently taking shop classes), and encouraging internal recommendations from current apprentices.

The university arranges an annual session at a local high school about the program. This session is hosted by a current apprentice, who discusses his or her experience and answers questions. The discussion also emphasizes application tips, such as how to prepare for an interview and how to answer the free-response questions on the application. The university considers these apprentice-hosted events to be some of their most successful application drivers.

Source: University of Virginia, Charlottesville, VA: Facilities Forum interviews and analysis.

University of Virginia (cont.)

Marketing and Recruitment (cont.)

UVA also markets its program by posting information at local hardware shops and publishing ads on the radio, on TV, and in local newspapers. UVA has been particularly successful at leveraging local media stations to drum up interest in the program, often at little or no cost; for example, UVA will invite local news stations to cover the university's job fair, and then direct reporters to current apprentices for interviews. The department also partners with entities such as the NAACP, community colleges, and homeless shelters to raise awareness of the program among specific demographics.

WIKIMEDIA COMMONS.

The Rotunda.

Additionally, UVA recruits internal candidates from within the Facilities department. UVA seeks candidates who are high school graduates or hold GEDs, are at least 18 years of age, and have less than two years of experience in their desired trade. UVA also recently began screening candidates for their distance from campus after observing that apprentices living further from campus are more likely to leave the university after graduating. Recruitment takes place in February and March of each year, followed by spring interviews and onboarding in July.

Selection

Competition for the apprenticeship program's 12 to 15 spots each year is intense, and the department often receives hundreds of applications. Because of this, the program recently instituted a more personalized application that asks students to answer free-response questions. The questions are designed to provide evaluators with a better sense of the applicant's drive, commitment, passion, and potential leadership qualities. Recent questions include prompts such as "How would your supervisors or teachers describe your strengths and weaknesses?" and "What are your top three values?"

Once candidates have passed an initial screening interview, which is contracted out to a third party, they are evaluated by a trade-specific selection committee. The committee has four to five members: a manager in the department seeking an apprentice (who also serves as the committee chair); up to two representatives from the trade being recruited; a representative from Facilities Management Training and Development; and a representative from Human Resources. UVA uses standardized criteria to evaluate each candidate, including the written application, multiple interviews, and a reading and math online assessment for final round candidates. The assessment is used to determine best placement and if there is a need for remedial coursework. After final-round interviews, the candidates are ranked on a point system and admitted based on their score.

Although enrollment is flexible based on shop needs, Facilities tends to enroll at least two candidates per shop for a total class size of at least nine. Facilities leaders feel this rate helps offset their staff turnover rate (about 20-25% annually).

Source: University of Virginia, Charlottesville, VA: Facilities Forum interviews and analysis.

University of Virginia (cont.)

Program Structure

The program is four years long, with apprentices working a regular 8-hour work day (with occasional overtime) and attending classes one night a week. Depending on the program, apprentices complete six to eight classes by the time they graduate from apprenticeship. Apprentices attend classes at one of three institutions, depending on their trade: Charlottesville-Albermarle Technical Education Center, Massanutten Technical Center, or Valley Vocational Technical School.

All apprentices begin at the same time each year in a single entering cohort. This makes administrative tasks such as paperwork more efficient, aligns every apprentice's start date with the schedules of technical schools, and encourages camaraderie within the group.

The supervisory system within the program is tiered, with apprentices reporting to their trainer, a journeyworker on the staff who provides the technical training. Trainers change regularly so that apprentices can experience a variety of teaching styles and environments. Assisting the trainers is the apprentice's designated mentor, who remains with the apprentice for all four years. The mentor is also a journeyworker, but not necessarily one in the same trade as the apprentice, because their purpose is not to provide technical training. Instead, the mentor supplies the apprentice with practical advice, career guidance, moral support, and other general assistance.

Both trainers and mentors report to the apprentice's supervisor, who is generally the shop head of the apprentice's chosen trade. Trainers, mentors, supervisors, and other program staff collaborate every time the apprentices change instructors or locations, collectively determining the appropriate level of work at each stage. This gives the program the flexibility to accommodate students who learn quickly and are ready for bigger challenges, or who may have stumbled with a particular skill and need additional instruction.

There are two types of assessments in the program. The first is a monthly assessment, which occurs between the apprentice, their current trainer, and their supervisor. To prepare for this meeting, apprentices write up a short report of what they have done and learned in the last month, which is submitted to the supervisor before the meeting. At the meeting, the apprentices also have the opportunity to ask questions or suggest other skills they would like to learn. Both the notes from this meeting and the write-up from the apprentice are submitted to the program's manager and directors, who can comment on them. Based on the results of these assessments, they are recommended for continuation in the program or remedial instruction/training. This structure, although labor-intensive, can encourage accountability at every stage of the management chain and allows all stakeholders to have a voice in the assessment process.

> "We should think in terms of continuous learning, not just stop when you come out of the apprenticeship program, but continuously learn. And think of Facilities programs in terms of a career and not just a job."
>
> *Don Sundgren*
> *Associate Vice President and Chief Facilities Officer*

Source: CBS19, "Uva Honors Newest Graduates of Apprenticeship Program"; University of Virginia, Charlottesville, VA; Facilities Forum interviews and analysis.

University of Virginia (cont.)

Program Structure (cont.)

The second assessment is held at the end of each year. Apprentices are formally assessed on whether they have mastered the proficiencies set forth in the program standards. Their supervisor considers their work over the last year, including classroom grades, and then ranks their ability on each proficiency, ranging from "no exposure" to "independently proficient." If skills gaps are found, the entire supervisory team will create a plan to make up the difference with additional instruction or an adjustment to the apprentice's training schedule. Apprentices also have the opportunity to sit down one-on-one with the program manager three or four times a year and discuss their experiences.

At the end of the program, apprentices take the journeyworker licensing exam. They also receive a period of extended career counseling from program managers, who coach them through the transition from apprentice to employee. UVA also holds an annual graduation ceremony for its outgoing class, which doubles as an induction ceremony for the newest group of apprentices. The ceremony serves a number of purposes: it imbues graduates with a sense of accomplishment and generates excitement among incoming apprentices. It also serves as an opportunity to raise awareness of the program and garner good publicity, as the event is usually covered by local media. The ceremony has become such an occasion that non-Facilities university leaders now attend, which makes it a powerful reminder to the rest of UVA about the program's importance.

Salary and Benefits

All apprentices are UVA employees from the first day of the program. Their salary increases each year and by graduation they earn a salary equivalent to an inexperienced journeyworker. UVA reports that they first determined the final salary and then worked backward to determine the rest of the pay grades. Trades command different salaries depending on the skills involved; for example, HVAC jobs typically require the use of mathematical calculations and so pay slightly higher. The only program time apprentices are not paid for is classroom hours.

UVA also provides a number of non-salary benefits to apprentices. As university employees, apprentices receive education benefits beginning at the end of their initial probation period. They receive $2,000 to $4,000 per year to take other classes or certifications offered by the university, in any discipline. The department also offers free soft skills courses through its Talent Development working group, including some that deal specifically with facilities-related jobs.

Apart from commuting to the university and technical schools, no costs are borne by the apprentices. The university covers all expenses, including books, tuition, tools, and equipment (e.g., suitable footwear or prescription safety glasses). These items are distributed to apprentices on their first day. The ability for apprentices to start work as soon as the program begins has become a strong selling point for the program.

Source: University of Virginia, Charlottesville, VA: Facilities Forum interviews and analysis.

University of Virginia (cont.)

Cost and Financing

The program is primarily funded by the billable work completed by the apprentices. Although apprentices have a lower rate than seasoned employees, this source covers most program costs. Staff credit the program's overall financial health to the strong support of Facilities leaders, who are committed to growing the program and have always been willing to cover any funding gaps with money from the department budget. This reflects the program's utility to the department overall—at any given time, 10% of the Facilities workforce is made up of apprentices.

Outcomes

UVA has a strong retention rate, with approximately 80% of its graduates continuing as employees. (This includes employees who previously worked for UVA but have now retired.) Career trajectory is very strong, with about a one-third of program graduates eventually reaching the management level; for example, the current Facilities supervisor at the UVA Hospital is a former apprentice.

Program Website

https://apprenticeship.fm.virginia.edu

1) Admission to UVA's apprenticeship program is significantly more competitive than admission to any of the university's academic program.

Source: University of Virginia, Charlottesville, VA: Facilities Forum interviews and analysis.

36486
Cover image: iStock

Washington DC | Richmond | Birmingham | Minneapolis
202.747.1000 | **eab.com**