The Return on Investment of Apprenticeship

The Costs and Benefits of Apprenticeship for Oregon Employers

August 2018

Community Attributes Inc. tells data-rich stories about communities that are important to decision makers.

President & CEO
Chris Mefford

Project Manager
Michaela Jellicoe

Analysts
Madalina Calen
Spencer Cohen, PhD
Maeve Edstrom
Maureen McLennon
Eric Viola

Leland Consulting Group
Alisa Pyszka, Principal

Community Attributes Inc.
500 Union Street, Suite 200
Seattle, Washington 98101

www.communityattributes.com

"This workforce product was funded by a grant awarded by the U.S. Department of Labor's Employment and Training Administration. The product was created by the recipient and does not necessarily reflect the official position of the U.S. Department of Labor. The Department of Labor makes no guarantees, warranties, or assurances of any kind, express or implied, with respect to such information, including any information on linked sites and including, but not limited to, accuracy of the information or its completeness, timeliness, usefulness, adequacy, continued availability, or ownership.

EXECUTIVE SUMMARY

Oregon employers participating in apprenticeship programs perceive a positive net benefit due to the program. Employers consider apprenticeship a long-term investment in their workforce, which helps them to develop a highly trained workforce. Many employers that participate in apprenticeship report that some highly skilled positions are difficult to recruit, which for some employers is particularly challenging as they plan for a large number of retirements amongst their skilled workforce.

Oregon employers struggle to measure the value of the benefits of apprenticeship, as reported similarly by prior studies. However, all employers report that they continue to invest in apprenticeship because they know the benefits outweigh the costs.

One of the most commonly expressed benefits of apprenticeship among employers is the ability to hire more for organizational fit, and less for readily applied skills. Apprenticeship provides a structured training curriculum, so the employer knows the skills that their employees will learn, freeing employers to hire people that they feel will be the best fit within the company culture. Some employers view apprenticeship as an extended interview process which has also reduced the costs of recruitment and hiring. Additionally, Oregon employers see apprenticeship as an opportunity to create a culture of mentorship within the company and as a way to increase retention.

Specific findings from interviews from four industries are discussed below.

CONSTRUCTION

Benefits. Employers mentioned that the greatest benefit of apprenticeship is the lower and more competitive bid rate that they are able to use with apprenticeship. They do not experience significant productivity losses, and with a lower cost of apprentices doing work that journey workers would otherwise do, there are significant benefits to apprenticeship.

Costs. The primary costs of apprenticeship for construction employers are apprentice wages and benefits. Compared to hiring a trained journey worker for the position of Inside Electrician, for example, apprenticeship provides the employer with a cost savings of $96,800 on average over four years of apprenticeship. Inside Electrician apprentices can provide employers an estimated net benefit of $150,000.

Employers might fear reduced productivity by mentors as a cost of apprenticeship. Construction employers, however, found that mentor productivity is reduced by just 5% to 10% during the training period, so mentor time is not a significant cost. Construction employers note that the benefit of reduced wages outweighs the costs of mentor time.

Training costs are incorporated into administration and operations for union-affiliated construction employers. Union construction employers mentioned that they make a contribution to the training fund based on the number of hours worked by both journey workers and apprentices. One employer mentioned that this contribution is about $0.80 per hour. The training fund provides all program administration, classroom training, supplies, and for some programs, stipends to apprentices for classroom time.

INFORMATION TECHNOLOGY

The net benefits of I.T. apprenticeships were found to range from a net cost of $13,800 to a net benefit of $56,200.

Benefits. One I.T. employer participating in the Apprenti program in Washington reported quantifiable benefits due to increased retention among apprentices as well as reduced costs for recruitment. Overall, accounting for these quantifiable benefits, the net benefits of just one year of apprenticeship are estimated at $47,700.

Other unquantifiable benefits reported by employers include the development of a strong pipeline of

skilled workers, increased mentorship and training company-wide, hiring employees that are a better fit with company culture, and the ability to train for niche skills internally.

Costs. Estimated total costs of apprenticeship for this same company are $92,000 to $162,500 depending on mentor time requirements. For comparison, an off-the street hire costs between $148,700 and $204,700 depending on mentor time requirements. This company fosters a culture of mentorship. Both apprentices and off-the-street hires are mentored, and additionally, the company noted that mentors are productive during mentor time, though they may experience some reduced productivity.

MANUFACTURING

Manufacturing employers invest in apprenticeship because the benefits that they do not quantify outweigh the known costs.

Benefits. Manufacturers uniformly view apprenticeship as a long-term investment that provides a highly trained workforce and a pipeline of skilled workers to replace retirees.

Costs. One interviewed manufacturer estimated that the total cost per apprentice over four years is $390,400. The alternative of hiring off the street would cost $299,600. The cost of apprenticeship for this manufacturer is therefore $90,700. This same employer recognizes that the quantifiable costs and benefits of apprenticeship lead to a net cost during the apprenticeship period, but they would not otherwise be able to hire the trained workforce they need. Manufacturing employers generally reported high costs for mentorship. For some mentor time is unproductive and the losses in productivity during that time are high.

HEALTHCARE

At the time that this report was written, Oregon did not have an established registered healthcare apprenticeship program. In April 2018 Oregon registered its first registered apprenticeship program for medical assistants. Washington's medical and dental assisting apprenticeships through the Washington State Association of Community and Migrant Health Centers (WACMHC), were established in 2014 and 2016 respectively. These positions are difficult to recruit and hire, and retention is an ongoing problem for employers.

Benefits. For healthcare employers participating in the program, the most important motivating factor for apprenticeship is to increase employee retention. By providing their employees with a career ladder and an investment in education, employers are able to increase retention. Hiring for these positions off the street is a challenge, and the costs are only increased by retention problems among these occupations.

Costs. Although no employers were available to be interviewed, reduced wage costs, based on apprenticeship standards and Oregon median wages provide an estimated cost savings of $4,500 to $8,400 depending on the occupation. The program is structured to allow apprentices to work at the top of their license throughout the training period and to allow any staff member with a higher license to provide mentorship and sign-off on skills mastery.

TABLE OF CONTENTS

This page was intentionally left blank.

INTRODUCTION

Background and Purpose

In 2016 the U.S. Department of Labor Employment and Training Administration awarded Oregon funds through the Apprenticeship USA State Expansion Grant program. With these funds Oregon's program Advancing Oregon Apprenticeship, is undertaking efforts to support apprenticeship as the preferred training model in Oregon. The Oregon Higher Education Coordinating Commission together with Oregon's Governor, the Oregon Workforce Investment Board, the Oregon Bureau of Labor and Industries, the Oregon Employment Department, the Oregon Department of Human Services, the Oregon Department of Education, local workforce and education partners, and Oregon Tradeswomen, Inc., proposed a project to further information on the costs and benefits to employers of apprenticeship. Businesses have indicated that there are significant benefits from apprenticeship, but there are few studies addressing this information. The information from a study on the costs and benefits of apprenticeship will be available as a resource in efforts to expand and develop new apprenticeship programs in Oregon.

The Oregon Higher Education Coordinating Commission asked Community Attributes Inc. to conduct a study on the costs, benefits and return on investment of apprenticeship in Oregon. This effort was comprised of multiple phases, starting with a thorough review of existing literature studying the return on investment of apprenticeship, followed by interviews and case studies on Oregon employers engaging in apprenticeship, culminating in a report detailing the findings on the costs and benefits of apprenticeship for employers in Oregon. This project additionally includes the development of an online tool to help businesses explore the potential return on investment for apprenticeship within their business model, which can be explored at oregonapprenticeship.org/roi-calculator.

Methods

This report examines existing literature on the costs, benefits and return on investment (ROI) to employers from apprenticeship programs. ROI studies of apprenticeship programs have many shapes, sizes and forms and can be used for several purposes such as measuring the effectiveness of training, maximizing returns on investment or demonstrating accountability for expenditures and policies. However, all ROI studies have one thing in common – the relationship between a set of benefits and costs in a firm.

In order to understand the costs and benefits of apprenticeship for businesses in Oregon, local workforce, industry and apprenticeship program stakeholders were interviewed. Additionally, Oregon employers were interviewed and asked to complete a questionnaire on the value of costs and benefits to apprenticeship for their company.

Organization of Report

This report includes the following sections:

- **Key Findings from Previous Studies:** Provides an overview on the key takeaways from the existing literature on the costs and benefits of apprenticeship to employers.
- **Oregon Apprenticeship:** Details the overall findings from interviews with Oregon workforce and apprenticeship stakeholders.
- **Industry-Specific Findings:** Provides key findings for four selected industries, estimating the potential value of costs and benefits to Oregon employers from apprenticeship.

KEY FINDINGS FROM PREVIOUS STUDIES

A common theme that arises from much of the literature is that the estimated net returns from apprenticeship programs vary widely across countries and even across businesses within the same country. This suggests that there are many factors than can play an important role in apprenticeship profitability, from industry, occupation and firm size to institutional features such as links with the education and training system, existence of a certification system and more.

The body of literature generally agrees that employers receive a positive return on investment from apprenticeship programs. While some firms receive a net benefit during the training period, others only receive a net benefit after the training period is complete.

Throughout the literature authors consistently find long-term net benefits to employers from apprenticeship and learn that employers perceive that apprenticeship is a benefit. The magnitude of benefits is highly variable depending upon the trade, industry and methodology employed in each study. Additionally, the short versus long-term net returns on investment are highly variable.

Case Study Findings

A 2016 study by Case Western Reserve University and the U.S. Department of Commerce, The Benefits and Costs of Apprenticeship: A Business Perspective takes a case study approach to measure the return on investment to businesses due to apprenticeship. This study examines 11 businesses, and conducts a detailed assessment of two businesses, Siemens USA and Dartmouth-Hitchcock. The costs addressed by Case Western Reserve University include both fixed and variable costs, including: curriculum development; equipment purchases; staff time spent on setup; overhead and management; classroom space; recruitment; wages and benefits; mentor time; supplies and uniforms; and tuition, books and classroom materials. (Case Western Reserve University, 2016)

Benefits addressed in the study are broken into three categories: production, workforce and soft skills. Production benefits include output during the apprenticeship at a reduced wage, higher post-apprenticeship productivity relative to other employees and reduction in mistakes and errors. Workforce benefits include reduced turnover, a pipeline of skilled employees, better matching of employee skills and character with employer needs, lower recruiting costs and development of future managers. Soft skills benefits include employee engagement and loyalty, greater problem-solving ability and reduced supervision requirements. These costs and benefits were quantified for both Siemens USA and Dartmouth-Hitchcock depending on the availability of data for measuring these costs and benefits. (Case Western Reserve University, 2016).

The total cost to Siemens USA due to the apprenticeship program was $131,000 per apprentice, yet the study estimates a 50% rate of return on the apprenticeship program compared to hiring a machinist off the street. The study found that Dartmouth-Hitchcock had a total per apprentice cost of $47,000, which was just $10,000 higher than hiring a fully-trained employee. Overall, the return on investment for Dartmouth-Hitchcock was estimated at $33,000 to $45,600. (Case Western Reserve University, 2016)

A study of Canadian firms found that employers experienced net benefits across regions and industries throughout the country. Over a four-year apprenticeship net benefits are estimated at $39,524 to $245,264 depending on the trade. The survey methodology also found that employers felt that an employee trained through their own apprenticeship program are 29% more productive than the alternative. (Canadian Apprenticeship Forum, 2009)

Mauldin, in the study Apprenticeship in the Healthcare Industry looks at the use of apprenticeship in the healthcare industry in the United States, as well as looking very generally at how apprenticeships are implemented in Great Britain, Germany and Australia. The main feature in assessing the return on investment of apprenticeship in the healthcare industry is a case study of MultiCare's apprenticeship programs in Pierce County, Washington.

There are a variety of costs that MultiCare uses to assess the return on investment in apprenticeship.

The first cost addressed is the cost of leaving a journey-level position to train an apprentice, which is addressed by putting apprentices into lower level helper positions during training, which would otherwise have been filled by a non-apprentice. The cost of recruiting an Registered Nurse (RN) either new or experienced is estimated at $50,000 to $75,000 per RN. This estimate includes advertising expenses, paying a recruiter, processing and three weeks of paid orientation. In comparison, the cost to MultiCare for their Licensed Practical Nurse (LPN) to RN bridge program is $20,000 to $25,000. The bridge program requires a shorter residency period, additionally, the bridge program candidates are already familiar with the company and practices. The program also offers the company a high retention rate, 90%, which is increased by MultiCare's policy that candidates must stay with the company for three years or pay back the costs of the training. (Mauldin, 2011)

Common Cost and Benefit Variables

Specific variables measuring the costs and benefits of apprenticeship in prior studies include the following variables outlined in Exhibit 1.

Exhibit 1. Apprenticeship Cost and Benefit Variables

COSTS	BENEFITS
Wages and benefits	Reduced wage costs
Mentor time	Increased productivity
Tuition, books and classroom materials	Staff retention
Recruitment	Increased pool of employees for internal leadership development
Curriculum development	Benefit of training workers with company-specific protocols
Equipment purchases	Wage stability
Staff time spent on setup	Enhanced recruitment
Overhead and management	Customer satisfaction
Classroom space	Increased employee flexibility
Supplies and uniforms	Cost savings on further training and hiring costs

Reduced wage costs are the difference between the cost of an apprentice and the cost of hiring a skilled or unskilled non-apprentice laborer to do the same tasks for the same amount of time. Prior studies also found a wide range of intangible benefits from apprenticeship including:

- Image
- Job satisfaction
- Organizational commitment
- Employee engagement
- Teamwork
- Customer service

- Brand awareness
- Creativity
- Social Responsibility
- Increased innovation
- Reduced challenges to technology adoption

Although these intangible benefits are infrequently quantified, companies using apprenticeship place value on these benefits.

OREGON APPRENTICESHIP

Oregon employers across four industries were interviewed to gain an understanding of employers' perspectives on the costs and benefits of apprenticeship. Additionally, regional workforce stakeholders and industry stakeholders were interviewed to gain a broad understanding of the regional strengths and challenges to each industry and inform an understanding of the employers' perspective on the costs and benefits of apprenticeship. Apprenticeship programs were also interviewed, particularly in industries with new and emerging apprenticeship programs.

Overall, Oregon employers participating in apprenticeship express that they invest in apprenticeship because they experience an overall positive benefit. Most employers were able to quantify the costs of apprenticeship, particularly the costs of wages and training. However, employers struggled to quantify many of the benefits of apprenticeship. Despite their limited quantitative data to provide evidence of a positive return on investment, these employers continue to invest in apprenticeship because they either have limited options for filling positions through alternative means or understand qualitatively that they receive an overall net benefit.

Workforce and industry stakeholders expressed an overall positive outlook on apprenticeship and believe that there is a market for apprenticeship in many industries. However, these workforce and industry stakeholders also brought to light some challenges and barriers that prevent companies from investing in apprenticeship.

Oregon Apprenticeship Perspectives

Strengths

Overall, Oregon stakeholders expressed that there is enthusiasm within the community about apprenticeship opportunities. There is high demand for skilled labor, and these needs for skilled labor generally outweigh any concerns employers might have about apprenticeship. Additionally, while the workforce community did not express a strong understanding of how apprenticeship programs work, they are interested in becoming more involved with apprenticeship and see the programs as a benefit for both the workforce and employers.

Stakeholders also noted the development of new programs and opportunities for collaboration. The Lane County Apprenti program was provided as an example of a program that has the potential to help employers fill the skills gap they are experiencing and develop new skills to keep up within a highly competitive industry. Benefits of the program mentioned include the flexibility that the program provides employers—employers are able to train employees to their particular needs—as well as the funding incentives available through the program. The Apprenti program has funding incentives which help offset the startup costs of developing an apprenticeship program.

Programs serving industries that do not have a long history of apprenticeship were of interest to Oregon stakeholders. Both I.T. and bioscience were mentioned specifically as areas of interest within Lane County.

Opportunities for partnership were mentioned as a strategy to increase participation in apprenticeship programs among both employers and employees. On the employer side, one stakeholder mentioned

that perhaps universities could consider partnering with apprenticeship programs, which could provide them with a competitive advantage and would provide students with job opportunities. Stakeholders also mentioned partnerships between employers as a strategy to increase employer participation, small businesses could work together to create a program which can offset some of the startup costs. Additionally, stakeholders are looking for opportunities to advance and share previously developed programs, like Apprenti, to leverage investments that have already been made.

Oregon stakeholders mentioned that apprenticeship is a long-term investment. Those companies that have already invested in apprenticeship are the same companies that adopt a long-range perspective toward investing in their employees.

Challenges

In addition to the positive outlook on apprenticeship in Oregon, stakeholders also noted a few challenges to utilization of apprenticeship. They mentioned challenges in recruiting employees into apprenticeship. There is still a focus on university degrees and perceptions about blue-collar careers that create barriers to reaching youth. There is a need to continue to raise awareness of the apprenticeship programs available and the career opportunities that apprenticeship offers. One suggestion was finding ways to increase partnership with universities and community colleges.

One of the most frequently sited challenges is the high upfront investment required to start an apprenticeship program. Small and mid-size companies have challenges with paying for those upfront costs, including initial program administration, convening industry partners, establishing related instruction, among others. Small businesses also struggle to lead curriculum development and may not have sufficient staff to actually implement an apprenticeship program. This was also mentioned by employers as a barrier to expanding their programs. However, programs that are easily transferred between companies and geographies were cited as an opportunity for small and mid-size employers.

Rural areas were also noted to have specific challenges with increasing apprenticeship. Stakeholders from rural areas said that employers may not have sufficient staff to provide the necessary mentorship, which can be a barrier to adopting apprenticeship. Additionally, rural areas at times also have challenges finding cost effective solutions to providing the required classroom time, due to impediments to filling classrooms. One potential solution mentioned are online classes. Stakeholders also emphasized the importance of business collaboration for rural areas.

Workforce and industry stakeholders also mentioned some common fears expressed by companies. The most common of these is the fear among employers that they will invest in apprenticeship, but their apprentices will either leave or be poached by other companies. The manufacturing industry also faces challenges associated with the cost of mentor time. They have to bear the cost of paying apprentice wages while those apprentices are not productive, as well as the cost of reduced productivity among mentors. Stakeholders mentioned that manufacturers need employees that are immediately able to produce.

Oregon Employer Benefits and Costs

In general, Oregon employers participating in apprenticeship expressed that their apprenticeship programs provide an overall positive return on investment. Typically, employers don't track the benefits of apprenticeship in the same quantifiable way that they track costs, however, the benefits that they receive often are perceived to be sizable enough to outweigh the costs.

One of the most common benefits Oregon employers mentioned is the ability to hire for fit rather than for skills. The apprenticeship program provides them with a structured training curriculum, so they know what skills apprentices are learning and have confidence these skills fit their needs. This frees the employers to hire individuals that would not otherwise have been qualified but may be a better fit for the company. Many employers mentioned that this may increase retention and productivity in the long-term.

The employer also knows what the apprentice knows, they are able to track the skills and knowledge that their employees have. Employers are able to use the apprenticeship program to train the next generation of leadership and supervisors within their company, generating employees that share the values of the company and are representative of the company culture. No employer was able to put a dollar value on the benefit of hiring for fit, but they value this benefit highly.

One employer mentioned that the apprenticeship training period is like an extended interview process. Instead of interviewing an individual once or twice, they get to interview the apprentice over the entire apprenticeship period. Associated with this, the hiring process for some companies can be very costly, one employer noted that it can cost between $5,000 and $30,000 to hire a junior employee off-the-street. This same employer found that with their apprenticeship program they no longer have to conduct a hiring process for junior positions, as they are able to fill these positions with apprentices.

Oregon employers also value the opportunity to foster a culture of mentorship and education within their company. Both the apprentice and the mentor receive benefit from the experience, becoming stronger employees and sharing their skills and knowledge with others in the firm. Some employers also mentioned that the apprenticeship program provides their apprentices with a diversity of training and exposure to different work environments. It also helps employers increase the overall diversity of their workforce. One employer mentioned that there is evidence demonstrating that more diverse companies are more profitable. Other employers mentioned that apprentices often have experience with new technologies and they have helped companies adopt new technologies to stay on the leading edge of their industry.

Most employers interviewed have experienced generally high completion rates among their apprentices and good retention of apprentice graduates. Despite the experience of established apprenticeship programs, employers new to apprenticeship still expressed concern over the high cost when apprentices fail to complete the program or move to a different company after completing the program.

Employers noted that while it is difficult to quantify the cost of mentor time, it is a significant cost to apprenticeship. While mentors are training apprentices, they are not producing. Some employers said their mentors were entirely unproductive during mentor time while others felt that mentors could be nearly fully productive while training the apprentice. The degree to which productivity is lost due to mentorship depends on the industry, company, apprenticeship program and individual apprentice and mentor. In addition to the lost productivity of the mentor, some employers mentioned that the team is still expected to achieve the same productivity as they would without the apprentice. This creates added pressure on the entire team to continue producing at the same level.

Oregon employers mentioned that an investment in apprenticeship is a long-term investment. Apprenticeship creates a pipeline of skilled workers for the business into the future. For some industries they choose to make the investment because they can't find skilled workers off-the-street. Some industries are anticipating a significant number of retirements in the future and they don't have an established labor force to replace the retirements. Overall, employers noted significant motivations for investing in apprenticeship, and despite the costs and challenges in quantifying benefits they feel that apprenticeship generates significant positive benefits for their company.

Common Employer Costs

Costs frequently mentioned by Oregon employers include:

- Apprentice wages and benefits
- Cost of mentor time, including wages and losses in journey worker productivity
- Cost of tuition and training

Employers also mentioned that scaling apprenticeship programs to meet market demand is a challenge, the format of apprenticeship is not quickly responsive to changes in demand.

Common Employer Benefits

Benefits frequently mentioned by Oregon employers include:

- Increases retention, which saves money on recruitment and hiring costs and reduces the amount of lost productivity between hires
- Assures a pipeline of skilled workers
- Generates higher quality workers
- Reduces the number of mistakes and errors
- Provides the employer with intimate knowledge of apprentice training and skills
- Creates a standardized training process that is more cost effective than training individual employees as they are hired
- Helps attract a more diverse workforce
- Provides a training program that continues to generate output during the training period
- Reduces wage costs for apprentices

INDUSTRY-SPECIFIC FINDINGS

Construction

Representatives from the construction industry participated in interviews to discuss the costs and benefits of apprenticeship for their companies. Interviewed employers were all union employers participating in union apprenticeship programs. Employers interviewed have apprentices in carpentry, laborer, finisher and operator, and electrical occupations.

Apprenticeship Program Details

In partnership with Oregon businesses and local apprenticeship committees, the Oregon Apprenticeship and Training Division oversees a system where Oregonians have access to quality career opportunities in the construction industry through paid on-the-job training and education.

Joint Apprenticeship and Training Committees (JATC) are responsible for overseeing each of their apprenticeship programs. JATCs are committees composed of both employee representatives and employer representatives. Employers reported that their JATC's regularly send out surveys to employers to assess future demand for apprenticeship. The results of this survey help the apprenticeship program prepare to serve the needs of their employers in the near future. In some programs associated with unions, if an employer needs an apprentice they submit a request to their JATC, and when an apprentice becomes available they are sent to the employer. If an employer no longer has enough work to support an apprentice that apprentice lets the union know that they are out of work and the union will send them to a new employer when a job becomes available.

Depending on the nature of the apprenticeship program and preference of the employers, the role of the JATC can vary. While all JATCs are responsible for providing oversight for the apprenticeship program, many are also involved in program operations. Many JATCs are responsible for apprentice recruitment, development of the program and curriculum, program administration, as well as provide classroom training. Other JATCs rely on third party administrators, such as community college employees, to help them with the day to day program operations.

Among the employers interviewed, each apprenticeship program is slightly different. The programs used by interviewed employers are all four to five years in length. One employer noted that apprentices in their program do most of their classroom training in the evening and receive a stipend from the JATC for classroom time. Another program has apprentices work on-the-job four days per week and go to classroom instruction one day per week. Another program has apprentices on-the-job four days per week and in the classroom one day per week for 11 weeks, the following 11 weeks are all on-the-job, this cycle is repeated throughout the apprenticeship program.

Motivation

Employers have a variety of reasons for using apprentices. Some of the motivations reported by construction employers include:

- The reduced wage cost of apprentices allows the employers to offer a lower and more competitive blended labor rate for their bids.
- Apprenticeship reduces employee attrition and provides a continuous source of new employees.
- The apprenticeship training period is similar to an extended interview and allows the employer time to determine fit.
- Apprenticeship allows employers to train their next generation of leadership and supervisors and provides employers with the opportunity to groom the future workforce to fit company culture.
- Apprentices bring diversity and a variety of experiences to the company, which is seen as an opportunity for growth.
- One employer also noted that they believe that the training offered through apprenticeship is currently the best available training.

Costs

WAGES AND BENEFITS

Construction employers interviewed noted that the primary cost of apprenticeship are apprentice wages and benefits. Like apprenticeship programs in other industries, an apprentice wage increases over time according to a wage rate schedule established by the apprenticeship program and the Oregon Bureau of Labor and Industries. For example, one of the firms interviewed hires Inside Wireman and Low Voltage Electricians at a starting apprentice wage that is 40% of a journey-level worker's wage and reaches 85% in the final (fourth) year of the program. The wage rate includes the cost of union benefits and taxes. An evaluation of performance is done once a month for the first year of the program and then once a year for the remaining program duration.

The average wage progression for an Inside Electrician apprentice in Oregon starts at 47% of the journey-level wage at $32.71 per hour, increasing to a maximum of 79% in year four. In total, on average an Inside Electrician apprentice costs an employer approximately $164,800 over the four years of the apprenticeship, based on a 2,000-hour year. Each individual program has their own wage progression and set journey-level wage.

For comparison a journey-level Inside Electrician on average would cost the employer $261,600 over four years. The apprentice therefore, on average results in a cost savings of $96,800 to the employer over four years.

MENTORING AND SUPERVISION

Apprentices require 100% supervision; however, some programs allow apprentices to earn a card in their final year allowing them to work independently. Employers typically had difficulty estimating the cost of mentor time. Multiple employers interviewed estimated that apprenticeship supervision and mentoring results in a 10% maximum loss in productivity for the mentors. The level of productivity losses among mentors depends both on the mentor and the apprentice. One employer estimated that a good supervisor may lose only 5% productivity, and another employer estimated that productivity losses among mentors may only be 7-8%. The unproductive time required for mentorship decreases over time as the apprentice acquires more knowledge and skills.

Assuming the average wage rate for an Inside Electrician, $32.71 per hour, and productivity losses at 10% in year one for the mentor decreasing to 5% by year four, the total estimated cost of mentor time is $49,100, based on a 2,000-hour year.

RECRUITMENT & TRAINING

Union employers interviewed reported that all costs associated with recruitment and training are covered by the JATC. Employers contribute a small amount per hour per journey worker toward the apprentice training fund. All costs for training and recruitment, including all classroom time, apprentice supplies and apprentice stipends (in some cases) are covered through this training fund. Union employers contribute to the training fund whether or not they currently employ apprentices.

One employer estimated that the training fund contribution is $0.80 per journey worker per hour and $1.20 per apprentice per hour. Apprenticeship standards for Inside Electrician require on average a ratio of three journey workers per apprentice. Based on a 2,000-hour year, an employer contributes $28,800 over four years per apprentice. This contribution covers all training and recruitment costs, and the contribution per hour for apprentices is also already counted in the apprentice wage and benefit costs.

OTHER

One employer mentioned that apprentices could possibly lead to higher costs associated with safety liability. Apprentices have less experience than journey workers and require additional safety training to mitigate risk. This may also involve slightly higher costs for safety orientation as well.

Based on industry average wages and apprenticeship standards an Inside Electrician apprentice costs $213,900 including wages, benefits and mentor time. A journey-level electrician costs $261,600. Apprenticeship therefore saves the employer $47,700 over four years compared with the alternative of hiring a fully trained full-time journey-level electrician.

Benefits

REDUCED BID RATE

Construction employers interviewed said that the main benefit of apprentices is a lower aggregate bid rate, making the company more competitive and increasing revenue. One firm estimated that the average journey-level bid rate is $70 per hour, while the apprentice bid rate may only by $40 per hour, giving them an aggregate bid rate of $50-60 per hour depending on the mix of journey workers and apprentices. Another employer estimated that the journey worker bid rate is $70 per hour and the apprentice bid rate is $35 per hour, providing them with a $55 aggregate labor rate.

One employer noted that while mentor time is a significant cost to the company, the lower aggregate bid rate they are able to offer alone provides a greater benefit to the company than the cost of mentor time.

PRODUCTIVITY AND OUTPUT

Employers all mentioned that apprentices are typically 90% productive in the construction trades, and possibly more productive at the later stages of the apprenticeship when they have more knowledge and skills.

One employer noted that if the employer is using the apprentice correctly, that apprentice will be doing the easier tasks appropriate to their skill level, and as they learn they can be tasked with more demanding responsibilities. This same employer mentioned that when an apprentice is doing work that the journey worker would otherwise have to do, then the difference in cost between the journey worker and the apprentice is profit for the company. This employer estimated that the difference in cost is about 40%, based on a 2,000-hour year and journey worker costs of $32.71 per hour. Therefore, an employer can earn as much as $104,000 over four years assuming that the journey worker would be doing all of the work without the apprentice.

RETENTION

Construction employers all experience high retention among their apprentices. Employers interviewed estimated that between 80-95% of all apprentices complete their programs, depending on the occupation

and program. Multiple employers have employees that went through the apprenticeship program and have stayed with the company for their entire career.

One employer estimated that they experience 90% retention among apprentices, or 10% turnover, compared to 14-20% turnover for off-the-street hires. Assuming average turnover of 20%, an apprentice reduces turnover costs by 10% over an off-the-street hire. If the construction industry recruitment costs are in-line with the national average cost of recruitment of $4,000 per employee as reported by the Society for Human Resources Management and there is a 10% reduction in turnover per year due to apprenticeship, then the value of increased retention is an estimated $400 per year.

OTHER

Other benefits mentioned by construction employers, which they are not able to quantify include the following.

- Apprenticeship provides them with a long-term supply of skilled and trained workers and offsets the retirement of skilled workers each year.
- Apprentices bring new ideas and are more connected and experienced with the current advancements in technology. One example provided was 3D drawing.
- Mentors become more skilled and gain knowledge by training apprentices.
- The next generation of leadership in the industry is trained from within the industry.
- Apprenticeships support workforce growth.

All interviewed employers strongly felt that the benefits of apprenticeship outweigh the costs. For interviewed union construction employers, the reduced wage cost of apprentices alone leads to a net benefit of $47,700 for an Inside Electrician based on industry averages over the alternative. Including the benefit of having an apprentice doing journey-level work, the total net benefit is more than $150,000 over four years.

It should also be noted that the interviewed employers have been using apprenticeship for many years and contribute toward the training fund for every hour worked. Additionally, some occupations require apprenticeship program completion to earn the required occupational license, so apprenticeship is the avenue by which employers replenish their workforce.

Information Technology

Oregon does not yet have a fully established IT apprenticeship program, however, employers, workforce associations and industry stakeholders are working together to implement the Apprenti program in Oregon.

Apprenticeship Program Details

Apprenti is an effort of the Washington Technology Industry Association (WTIA) Workforce Institute to address the workforce shortage in the tech industry and identify diverse talent to meet industry needs. It was funded in part by a $3.5 million grant from the U.S. Department of Labor, as well as private money. It is the first registered tech apprenticeship program in the nation according to WTIA.

Apprenti uses a competency assessment test and interviews to recruit candidates for their program and match them to companies looking to hire for tech positions. The apprenticeship program starts with 8 to 22 weeks of full-time practical skill instruction. After successfully completing the courses, apprentices are placed with a hiring partner for one year of paid on-the-job training based on occupational suitability and hiring partner demand. Upon completion of the program, participants have a national, portable certificate of occupational competence.

The program was launched in Washington state but is expanding to other parts of the country. As part of this study, two Washington-based employers participating in the Apprenti program were interviewed. In Oregon, Lane Workforce Partnership (LWP) and the Technology Association of Oregon (TAO) have

partnered with Oregon Employment Department to pilot Apprenti. The program launched in Lane county last year and will eventually be modeled throughout the State of Oregon.

OCCUPATIONS OF APPRENTICES

In developing the apprenticeship program, Apprenti focused on occupations that do not require a four-year computer science degree but are strong, living-wage jobs that pay well across the country and can attract talent to fill the industry skill gap. Apprenti also identified commonalities of these occupations across tech companies and the core education requirements to perform the work, which resulted in a set of "apprenticeable" jobs.

Apprenti offers apprentices in the following occupations: Software Application Developer, Web Application Developer, Network Security Administrator, Windows Systems Administrator, Linux Systems Administrator, Database Administrator, Project Management, Data Center Technician, Cloud Support Specialist, and IT Business Analyst. Apprenti can also build a specialized apprentice training program for companies interested in hiring apprentices.

MOTIVATION

Two of the biggest challenges for the technology industry are filling the skills gap and building a more diverse workforce. Apprenti focuses on both challenges.

The Apprenti program is aimed at diversifying the workforce in the tech industry by getting women, veterans and minorities into tech fields – groups that have found it difficult to break into the industry. In addition, the Apprenti program is a truly competency-based system that aims to remove or significantly reduce biases and barriers built into the hiring process for tech companies and put everyone on even footing.

To help fill the skills gap, Apprenti plans to train and place over 600 workers in apprenticeships by 2020, if not sooner.

Costs

WAGES AND BENEFITS

The training wage of an Apprenti apprentice starts at a minimum of 60% of the average market rate wage and increases to at least 70% after six months. At the end of the one-year apprenticeship program, the apprentice receives an annual review. Once the apprentice completes the program and the employer is satisfied with their performance, the apprentice is paid close or equal to market rate.

Apprenti has established a minimum level of compensation for their apprentices to ensure a living wage is provided. The minimum rate in King County in Washington state is $42,000 for most occupations; the minimum is $45,000 for Software Application Developer and Web Application Developer. Apprentices also receive medical, retirement and life insurance benefits.

One Washington employer indicated that they pay an apprentice roughly $55,000 per year (not including paid time off (PTO) and paid holidays), of which $50,000 represents base wage and the rest is benefits (approx. $1,200) and taxes (approx. 7.65%). This represents around 48% of the total compensation (not including PTO and paid holidays) of an off-the-street hire, in this case a Junior Software Developer with one to three years of experience at the time of hiring. Reduced wages due to apprenticeship provide the employer with an estimated $63,400 in cost savings compared to an off-the-street hire.

MENTORING AND SUPERVISION

Apprentices benefit from having a mentor or supervisor required to enhance the training. The mentor can teach them about the work, develop their skills, provide them with feedback and recognize their achievements. This represents an opportunity cost for a company because mentors may take periods of time off from their regular work or may work more slowly when teaching and supervising apprentices.

One employer indicated that one to three staff members are spending approximately ten hours per week training or supervising apprentices. This is an estimate and the actual number might be higher since apprentices and other employees at the company very often work in pairs, which encourages organic unstructured on-the-job training. However, the employer mentioned that not all the time invested in mentoring an apprentice is unproductive for the staff. Mentors still produce value together with the apprentice, although possibly at a slower rate than if they were working alone. Assuming all time spent mentoring or supervising is unproductive time, the maximum total cost to the company would be between roughly $35,000 to $105,000 per year (at a rate of $70 total hourly compensation for mentoring staff), depending on the number of staff providing mentorship. The employer however, noted that mentor time is not unproductive time, the mentor still produces value, just at a reduced rate.

The same employer estimated that one to three mentors spend eight to ten hours per week mentoring an off-the-street hire. Therefore, mentorship costs are not significantly higher for apprenticeship when compared with the alternative of hiring off-the-street. Depending on the number of staff providing mentorship, and assuming just eight hours of mentorship are required, costs are roughly $28,000 to $84,000.

Assuming all mentor time is unproductive, and three mentors work with the apprentice while just one works with the off-the-street hire, the maximum net cost of mentor time is $77,000. This estimate is high because mentor time is not wholly unproductive and the culture of the company promotes mentorship at all levels, so it is unlikely that apprenticeship dramatically increases the cost of mentor time.

Another employer noted that an additional cost to mentorship is the reduced capacity of the mentor, which flows through their entire team. The goals for the team remain the same, but the addition of the apprentice and the reduced capacity of the mentor increases the productivity required of the other employees on the team in order to achieve their goals.

RECRUITMENT AND TRAINING

Companies that hire Apprenti participants incur minimal recruitment costs. Companies do not need to spend time identifying the target population or reaching out because Apprenti staff select and pre-screen candidates prior to bringing the best to the hiring companies for interviews. Companies participating in the Apprenti program pay a one-time placement fee of $2,500 per apprentice.

Training costs for the Apprenti program are roughly $10,000 to $12,000 per apprentice and they are covered in full by Apprenti through private funding or grant funds. Companies that hire apprentices are not responsible for providing the classroom training and do not incur any costs for classroom training as part of the program. Apprenti is contracting with Code Fellows, TLG Learning in Bellevue, Galvanize, Northeastern University and others to provide the training.

One interviewed employer provides compensation to their apprentices during the training period. Apprentices complete all of their training at the outset of the program, depending on their skill level this can take as little as six weeks or as many as 22 weeks. Most employers do not provide compensation to their apprentices during the training period. However, one interviewed employer felt that their apprentices had a better chance at success and were able to move through the program more effectively and quickly if they had a source of income during the initial training period.

One interviewed employer noted that they incur additional costs for custom training that they provide to their apprentices, which they feel helps the apprentices learn the skills necessary for their company.

OTHER

One company interviewed noted that a potentially significant cost of the apprenticeship program is the failure rate of apprentices. Every apprentice that is not able to complete the program increases the overall cost for every other apprentice. It is important to note, however, that the Apprenti program is too new to have data available to determine the cost of apprentices dropping out of the program. This

same company has had apprentices that were able to convert to full-time employment early and has had apprentices that ultimately were not a good fit for the company.

Based on data provided by one I.T. employer, the cost of apprenticeship is estimated roughly between $92,000 and $162,500 depending on mentor time requirements. An off-the-street hire for comparison costs between $148,700 and $204,700 depending on mentor time requirements. Assuming the minimum time requirements for mentors, apprenticeship costs $56,200 less than an off-the-street hire. Assuming the maximum mentor time requirements for apprenticeship and minimum requirements for an off-the-street hire, the net costs of apprenticeship are a maximum of $13,800.

Benefits

OUTPUT

One employer estimated that new apprentices are as productive as a junior level hire within six months. This company discovered that the apprentice productivity gains over time are non-linear. At the beginning of the apprenticeship, apprentices are not productive, experiencing imposter syndrome requiring coaching to overcome. After the first few months they started to learn the skills as quickly as an off-the-street hire. By six months, the apprentices are as productive as a regular entry-level hire.

Another company interviewed found that apprentices are not productive for the first three to eight months on average. The first three months are spent in the classroom, the next five months are spent learning the skills on-the-job. The goal at this company is to achieve 50% productivity within the first six months and reach full productivity within nine to ten months.

RETENTION

One company interviewed indicated that 100% of their apprentices have completed the program. Apprenti offers employers the option to convert their apprentices to full-time after 1,000 hours if they meet the hiring requirements for an off-the-street hire. This option allows companies to secure commitments from their apprentices, the motivation being to reduce the chances of the apprentices being poached by other companies.

Additionally, all apprentices who were offered permanent employment have stayed with the company after graduating from the program. This translates to a 0% turnover rate, compared to an estimated 10% for an off-the-street hire. Another company was able to convert one of their first apprentices in less than a year, however, they also had some apprentices that were not a good fit for the company. It should be noted that the Apprenti program is in its early years and the data collected is based on a small sample of apprentices, the company noted that while they believe that apprenticeship will increase retention, they do not yet have the data support the assertion.

One company also expressed that attrition is a very high cost, estimating that it can cost upwards of $60,000 to replace an engineer, including all recruitment, training, and productivity losses. It could cost more than $100,000 to replace a senior level position. Based on these cost estimates, the company believes that any increases in retention among their workforce could result in significant cost savings. Assuming that apprenticeship reduces annual turnover by 10% and that it costs the company $60,000 in total to replace an entry-level position, cost savings due to apprenticeship could be as much as $3,000 per apprentice per year.

One immediate cost savings reported by the company is the elimination of their junior hiring requirements. The Apprenti program has filled all of the junior hiring needs. The company estimated that hiring a junior position requires a minimum of ten interviews. A hiring group requires 16 hours of senior employee time, at a rate of $200 per hour, depending on the number of hiring rounds required it can cost the company between $5,000 and $30,000 to make a junior hire.

OTHER

Microsoft is one of the companies that has signed up to take on Apprenti apprentices. The company recognizes the benefits to their organization from the apprenticeship program. Chuck Edward, head of Global Talent Acquisition at Microsoft said that Apprenti "provides the opportunity for someone to come in and work side-by-side with our employees and learn from that experience. The program provides pre-apprenticeship training and helps us access a more diverse, qualified workforce." [1]

One interviewed company strongly agreed that the apprenticeship program helps offset skill shortages and ensures a secure supply of skilled labor, increases employee engagement and loyalty and ensures better matching of employee skills and character with employer needs and firm culture. Another employer noted that the investment in apprenticeship is really about investing in the long-term future of their workforce pipeline, creating a pipeline of workers with the skills that will be needed to do the work five years into the future. Other benefits that the two interviewed employers have experienced or expect to experience include:

- Increased mentoring opportunities for other employees as apprentices bring valuable life and professional experience to the table, even if they might be new to their current profession. Additionally, one company mentioned that companies that are more diverse are more profitable.
- Apprenticeship provides the company with a better avenue to determine fit with the company, it is very challenging to determine through an interview alone if a new hire will be a good fit within the company.
- The company is able to hire for the niche skill sets required in each specific location. If the company is looking for three key skills in an employee, with the apprenticeship program they are able to find a candidate that has two of the three key skills and they can train for the third.
- Mentors, through their apprentice mentoring have been able to learn leadership skills and move upward in the company, improving company management.
- Increase the culture and mindset of mentorship and training throughout the company.
- Apprenti establishes a better connection between the company and the community.

Overall, interviewed employers feel that apprenticeship has a net positive benefit for their company, however, most of the benefits they have experienced have been difficult to quantify. Most of the benefits have been cultural, including improvements in soft skills.

Assuming the maximum level of mentor time required, apprenticeship provides a net benefit of $42,200 when compared to the alternative of hiring off-the-street in the first year of apprenticeship for one company. Assuming that apprenticeship reduces hiring costs by $2,500 per apprentice and saves $3,000 per apprentice in recruitment costs, apprenticeship provides the company with a net benefit of $47,700 in one year of apprenticeship.

Manufacturing

Representatives from several manufacturing companies that offer apprenticeship programs in Oregon were interviewed to determine the costs and benefits of apprenticeship.

Apprenticeship Program Details

The manufacturing apprenticeship programs offered by companies interviewed are non-union programs, registered in the State of Oregon. Program durations range between two and five years. Like all registered apprenticeship, the programs include a combination of classroom instruction and on-the-job training. For example, one Limited Maintenance Electrician apprenticeship program requires a minimum of 144 hours of classroom time and a total of 4,000 hours of on-the-job training.

1 https://www.geekwire.com/2016/apprenti-program-aims-train-place-600-tech-workers-led-wtia-backed-3-5m-grant/

Interviewed employers offer apprenticeship programs for a variety of occupations, including Machinist, Limited Maintenance Electrician (LME) and Plant Journey-Level Electrician.

Motivation

One important part of understanding the costs and benefits of apprenticeship for employers is understanding the motivation behind investing in an apprenticeship program. Below are motivations reported by one or more interviewed employers:

- Difficulty finding skilled workers due to a growing shortage of manufacturing workers.
- Concern about declining workforce in their company due to an aging population.
- Difficulty finding workers with skills such as the ability to use tools, working with metal, machine skills and educational skills to complement the practical ones. The education system falls short in providing these skills today. Increasingly young people have been moving into high tech, healthcare or other service industries.

Costs

WAGES, BENEFITS AND TAXES

Total compensation costs which include wages, benefits and taxes usually make up the bulk of an apprenticeship program's total costs. The Oregon State Apprenticeship and Training Division approves standards for apprenticeship programs in the State of Oregon which include information on apprentice wages and wage progression. The apprentice is paid according to a progressively increasing schedule based on specified percentages of the average journey-level wage consistent with skills acquired.

For example, the following are average percentages of the journey-level rate by period based on four companies with machinist apprenticeship programs in Oregon:

- 1st period: 60%
- 2nd period: 64%
- 3rd period: 68%
- 4th period: 72%
- 5th period: 77%
- 6th period: 81%
- 7th period: 85%
- 8th period: 90%

The average wage for journey-level workers employed by the participating employers in the machinist occupation is $30.33 per hour. Given the average journey-level wage, the wage progression and the total number of hours (8,000 hours over four years) required to complete the program, the total average wage cost for an apprentice in the machinist program is a little more than $175,000.

Amongst the manufacturing companies interviewed, one company mentioned that in the first year of the program, an apprentice is paid $15.60 per hour which represents 68% of the off-the-street hire hourly wage. The wage increases every six months as the apprentice masters additional skills and competencies. Apprentice benefits per year represent 40% of wages, compared to 35% for an off-the-street hire. An additional 10% is added in taxes bringing the total compensation costs to $231,629 per apprentice for the four-year program, and $278,400 per off-the-street hire over the same period. The apprentice reduced wage cost amounts to a savings of nearly $46,800 over four years for the employer.

Most companies that participated in the interviews mentioned that apprentices get a raise roughly every six months and when they graduate earn somewhere in between 90% and 95% of the journey-level worker wage, depending on the program. One year after graduation from the program apprentices are paid the full journey-level wage.

MENTORING AND SUPERVISION

The supervision and mentoring needed to support apprentices has been mentioned as a cost of apprenticeship programs by some of the companies interviewed. Apprentices are paired with a mentor or are assigned a supervisor who takes time from his or her regular duties to guide the apprentice, help the apprentice apply their technical skills to the assigned tasks and help integrate the apprentice into the company. Mentors or supervisors are usually senior members of the firm's workforce. When they take time to teach apprentices, they often work more slowly or take periods of time off from their regular work. One company interviewed mentioned that when providing mentoring or supervision, a journey worker operates at 50 to 60% of their capacity which reduces their output.

Most of the companies interviewed do not quantify mentoring and supervision costs. One of the firms estimated that the cost of journey-level mentorship represents around 25% of their total apprenticeship costs.

One company was able to provide more data to estimate their mentoring and supervision costs. The firm reported that they have two staff members responsible for mentoring and supervising apprentices, each spending approximately 1,000 hours per apprentice in the first year of the program. The number of hours spent per apprentice decreases to 250 per staff member in years two and three of the program and 100 hours in the final year. The average compensation per hour of the company's typical staff member assigned to mentor and train apprentices is roughly $42. Therefore, the total cost per apprentice for the four-year duration of the program is $134,400. This company also mentioned that their costs of mentorship are high and that their mentors are not productive during their mentoring time. However, this situation may be unique to this employer, other interviewed employers did not report the same degree of mentorship costs.

For comparison, the same company estimated that 60 staff members provide training to off-the-street hires, requiring about 60 hours per year of mentor time. Over four years mentoring costs are $18,400 for an off-the-street hire.

RECRUITMENT

One interviewed employer indicated that all their apprentices are incumbent workers. The company mentioned that they want to provide their employees with opportunities to advance. Incumbent workers have applicable knowledge and have already been trained in the relevant areas. Applicants that meet the minimum qualifications are interviewed and the best candidates are selected for the apprenticeship program. The company reported the estimated apprentice recruitment and hiring cost is $1,025, compared with $2,100 for an off-the-street hire. The apprenticeship therefore saves $975 in recruitment costs. Recruitment costs could be higher for other companies, according to the Society for Human Resources Management the national average cost of recruitment was $4,000 in 2016.

TRAINING

Apprentices enter into a structured training program of classroom and paid on-the-job training which may differ from one program to another. For example, for the machinist program apprentices must attend 611 hours of related/supplemental instruction per year they are registered in the program. Electrical apprentices are required to go to school year-round, one night per week for three hours per night. Time spent in related/supplemental instruction is sometimes not considered as hours of work, and the apprentice may not be paid for time spent in classroom instruction.

One of the companies interviewed reported they pay $160 to $200 per term for instruction for apprentices. The company has partnerships with colleges and the classes are structured for them, but they also serve other companies.

One company that provided data on costs and benefits of their apprenticeship program reported that they pay $5,500 per year in tuition costs per apprentice for the duration of the program. For an off-the-

street hire, the same company provides two weeks of ongoing training at an estimated cost of roughly $2,700 per hire.

Another company indicated they apply for grants to fund the tuition costs of $10,000 per apprentice. The overall cost of tuition varies greatly between program and occupations.

In addition to tuition, supplies are also a cost reported by employers. One employer estimated that supplies cost $1,300 over the four years of the apprenticeship program.

OTHER

Manufacturing employers when interviewed noted several constraints on expanding their apprenticeship programs: 1) to train apprentices time on equipment is required 2) the time to train apprentices takes time away from production 3) there may not be enough equipment available to expand the apprenticeship program 4) journey-level coaches need to have enough time available to teach, but they also need to have time to do their regular production activities 5) the company incurs more costs to backfill time not spent on production.

The total estimated cost for the apprenticeship program for one company is $390,400. Their alternative is to hire off-the-street, which would cost $299,600 over four years. The net cost of the apprenticeship program is therefore $90,700.

Benefits

OUTPUT

One of the most common benefits of apprenticeship programs is that apprentices are usually able to produce value while training at reduced wages relative to an off-the-street hire. An apprentice's productivity might be lower than that of an off-the-street hire during the apprenticeship period, but after they graduate, apprentices are just as productive if not more productive than workers that did not receive such training.

One employer was able to provide data to estimate the value of output produced by an apprentice during the program for one of the firms and compare it to the value of output for an off-the-street hire. The company mentioned the profit margin per apprentice is 5% in the first year of the program or roughly $2,400, based on the value of wages and benefits in year one. The estimated profit margin for an apprentice increases by five percentage points per year, up to 20% in the fourth and final year of the program, or $13,800. In total, the employer earns $30,800 on apprentice output during the four years of the apprenticeship period.

An off-the-street hire is estimated to generate 10% profit margin in the first year, increasing to 15% in year two and reaching 20% by year three. This same employer estimated that a fully trained journey-level worker produces on average 20% profit margin. For an off-the-street hire, the profit margin is $7,000 in the first year, doubling by the third year. However, apprentices receive more targeted training than off-the-street hires bring to the company and they have a quicker learning curve than off-the-street hires as well.

INCREASED RETENTION

The benefits from increased retention are related to:

- Reduced turnover costs like recruitment and onboarding costs
- Reduced loss in productivity due to hiring delays

One of the interviewees mentioned it can take a month or more to fill a position given the labor market and the specifics of the job. A day shift job may take a week or two to fill while a swing shift or weekend shift job can take much longer. Assuming that a position takes a month to fill and during that time there

is zero productivity, the loss in productivity can be valued as $6,400 based on off-the-street hire output in year one.

One of the companies interviewed reported that 90% of apprentices completed their program and 100% of completed apprentices stayed with their company after graduating from the program.

OTHER

Other benefits mentioned during interviews include:

- Less production waste due to highly skilled people trained to the company's standards.
- Reduced onboarding costs because of high retention rate.
- Development of a certain percentage of employees to a higher skill level than the current skill level for production machinists, which the employer believes to be the best model to bring an employee up to skill level to do more specialized machinist work.

The most common motivation and benefit of apprenticeship is the supply of highly trained workers created. One company interviewed noted that they have cut back on apprenticeship in the past few years and now as a result is struggling to build their workforce. This same company anticipates that they will begin to increase the number of apprentices in order to offset a large number of retirements expected within the next five years. Companies are typically not able to quantify the value of having a skilled pipeline of workers. For some, apprenticeship is the only way to fill highly skilled positions, so the value of apprenticeship for these firms is difficult to overstate.

One employer said that the overall return on investment in terms of costs and benefits that they are able to quantify is negative during the apprenticeship period. However, they continue to invest in apprenticeship because they would not be able to hire the trained workforce that they have trained internally. The apprentice graduates are trained to a higher skill level and are able to do more tasks than off-the-street hires. Not all employers experience negative returns during the apprenticeship period, the overall return is highly dependent on the costs and benefits experienced by each individual employer.

Healthcare

Oregon registered its first registered apprenticeship program in healthcare in April of 2018, for the medical assistant occupation. At the time of writing, Oregon's program was not yet established and as it is within its first months, employers do not yet have data to provide on the costs and benefits of apprenticeship. Washington, however, does have established healthcare apprenticeships in medical and dental assistant occupations. Washington employers, however, were not available to be interviewed to provide a quantitative analysis of their costs and benefits.

One workforce stakeholder interviewed said that the healthcare industry in Oregon is experiencing a shortage of skilled workers, is experiencing a high rate of retirements and is having a difficult time finding skilled workers to fill the labor demand. The workforce system in Oregon has been working with healthcare employers and is considering apprenticeship as a method to solve the hiring challenges. However, to date employers do not have capacity to participate in the development and administration of an apprenticeship program.

Apprenticeship Program Details

The Washington State Association of Community and Migrant Health Centers (WACMHC) is a member association that represents all community health centers across the state. Community health centers are federally funded healthcare organizations that provide medical, dental and behavioral health services to people, particularly those that do not traditionally have access to healthcare.

In 2014, WACMHC started an apprenticeship program in medical assisting (MA) and started a pilot program for dental assisting (DA) in 2016. Apprentices are employed at participating community health organizations, and WACMHC runs the apprenticeship program. WACMHC is responsible for administering

the program, working with the Department of Labor and Industries, developing curriculum and ensuring that the program meets licensing requirements for each occupation.

Both the MA and DA programs are 12-month programs, requiring 2,000 hours of on-the-job training. Apprentices are employed full-time. The coursework is provided through an online program, which the apprentices are responsible for completing on evenings and weekends. The required classroom instruction requires about 340-460 hours or 10-12 hours of additional work per week. Each week the apprentice completes a skill module similar to traditional classroom instruction, which is monitored by a MA or DA instructor.

According to one stakeholder, as of 2017, WACMHC has 140 apprentices in the MA program and 12 DA apprentices in the pilot program. These apprentices are employed by 16 different employers.

Motivation

The WACMHC apprenticeship program was initiated because employers came to the association needing MAs and DAs. These positions are hard to recruit in rural areas and employers also experienced challenges in retaining employees in these positions. Future program development will also be informed by employer demand.

WACMHC has plans to continue expanding their apprenticeship programs. The programs that are developed and piloted are driven by employer demand, and employer feedback on which positions are most challenging to recruit and retain workers.

Costs

WAGES AND BENEFITS

The employer is responsible for the wage and benefit cost of the apprentices, but apprentices are only paid for their on-the-job training hours. Apprentices are hired as a full MA, allowing them to work at the top of their licensing during their training period.

According to the apprenticeship standards a medical assistant earns 83% of the journey-level wage in the first 1,000 hours of the apprenticeship and 92% for the final 1,000 hours of the apprenticeship. The median wage for a medical assistant in Oregon is $17.75, therefore the wage cost during apprenticeship for a medical assistant is estimated at $31,000, compared to $35,500 for an off-the-street hire, or a savings of $4,500.

The dental assistant earns 73% of the journey-level wage for the first 1,000 hours and 87% for the second 1,000 hours of their apprenticeship. The median wage for a dental assistant in Oregon is $21.12. The apprentice costs to the employer is estimated at $33,800, compared to $42,200 for an off-the-street hire, providing a cost savings of $8,400.

MENTORING AND SUPERVISION

For the first month of the 12-month program apprentices shadow their mentor, or coach. After that, the apprentice has the remainder of the year to learn and master skills, with regular check-ins with their coach. The program requires a one-to-one relationship between mentors and apprentices, but anyone with a higher license can teach skills to apprentices and can sign-off on skill mastery.

TRAINING

Employers pay WACMHC a one-time flat fee per apprentice for the tuition cost. The MA program costs $3,750 and the DA program costs $5,750. According to WACMHC, 98% of participating employers pay for the tuition costs for the apprentices in exchange for a commitment contract for 1-2 years from the apprentice.

RECRUITMENT

Washington state requires that MA and DA apprentices are over 18 and have either a high school diploma or a GED. The employer hires the apprentice through their own hiring process. The majority of employers have either identified an incumbent worker to participate in the apprenticeship program or hired an individual to place into the program.

Assuming that the apprentice is an incumbent worker, then the costs of recruiting that employee were the same as the costs of hiring other off-the-street hires.

Benefits

RETENTION

Increases in retention is the most important benefit for participating employers. Participating employers have had challenges in retaining their skilled workforce, this is particularly acute for organizations in rural and other areas where it is hard to find trained workers in healthcare occupations, according to one stakeholder.

One interviewed stakeholder estimates that program-wide 98% of apprentice graduates have continued to stay with their employer. Employers are offering their employees a career ladder, and an incentive to stay with the clinic. Apprentices that have completed the program have reported that they see the apprenticeship program as their employers investing in their career.

OTHER

Other benefits that employers have reported include:

- Apprenticeship programs expand the pool of people that employers can hire. This increases the potential to reach a more diverse audience and bring more diverse workers to the industry.
- The program provides a supply of trained workers, which is especially important as the industry faces an increasing number of upcoming retirements.
- Employers use the apprenticeship model as an opportunity to train workers in their company culture. Additionally, employers can train individuals that are interested in working in community health, which can be a challenging field.

SUMMARY AND CONCLUSIONS

Overall, across the existing literature and among Oregon and Washington employers using apprenticeship, there is strong support for apprenticeship and an overall belief that the benefits of apprenticeship outweigh the costs.

Interviewed employers generally do not quantify the benefits or costs of apprenticeship. Rather, apprenticeship is an investment that they make for the long-term development of their workforce. In some cases, employers are not able to find skilled workers to fill positions, in some cases they are facing a wave of retirements, in other cases they have challenges in retaining trained employees. Employers typically do not assign a quantitative value to having a pipeline of skilled workers, but they know that without those workers in many cases they would not be able to do the work required or it would create added pressure on existing employees.

Typically, employers were able to quantify the costs of apprenticeship in terms of wages, benefits, training costs and recruitment, but struggled to quantify the cost of mentor time. Interviewed employers acknowledged that mentor time is a significant cost in wages and benefits as well as lost productivity for the employer. One manufacturing employer estimated that mentor time cost $134,400 over four years. Some employers estimated that mentor time is 100% non-productive, while others, in the construction industry for example, estimated that mentors experienced just a 5% to 10% decrease in productivity.

Training costs are also highly variable between industries, ranging between $2,500 to $5,750 among interviewed employers. Some programs require a one-time contribution by employers, while others require a per hour contribution on all employees. Union construction employers, for example, make a contribution to the training fund for each hour worked by employees, which covers all apprenticeship training costs.

While employers generally were able to quantify the costs of apprenticeship, they struggled to quantify the benefits of apprenticeship. One manufacturing employer recognized that the apprenticeship program was a net cost per apprentice during the training period, but they would not otherwise be able to find the skilled workers. Construction employers noted that the reduced wage costs for apprentices allow them to offer a reduced bid cost, which helps them remain competitive and increases revenue. IT employers are able to hire employees that fit well within the company culture and are able to train for the specific skills they need. The main motivation for creating the healthcare apprenticeship program was to help increase retention among apprenticeable occupations. Each of these motivations outweigh the overall costs of apprenticeship.

Among both construction and IT employers, depending on the costs of mentorship, the reduced wage cost of apprenticeship leads to an overall net benefit to employers compared to the alternative of hiring a worker off-the-street during the apprenticeship period. These net benefits range between $42,000 and $47,700.

Overall, interviewed employers participating in apprenticeship recognize that apprenticeship has a positive return on investment, especially those employers that struggle to find skilled workers. However, most employers do not have data collection systems in place to track the value of benefits of apprenticeship.

REFERENCES

Canadian Apprenticeship Forum. (2009). It Pays to Hire an Apprentice: Calculating the Return on Training Investment for Skilled Trades Employers in Canada. Canadian Apprenticeship Forum.

Case Western Reserve University. (2016). The Benefits and Costs of Apprenticeships: A Business Perspective. U.S. Department of Commerce.

Mauldin, B. (2011). Apprenticeships in the Healthcare Industry. U.S. Department of Health & Human Services.