



Building Sustainable Apprenticeships

The Case of Apprenticeship 2000

Bhavani Arabandi, Zach Boren, and Andrew Campbell

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Sustainable apprenticeships play a critical role in building a large-scale American apprenticeship system, and ultimately contribute to a robust and diversified American workforce. One approach to sustainability and quality is the creation of employer consortia, or groups of employers. For employers, consortia offer cost-effective mechanisms for developing apprenticeships into an enduring talent development strategy. For apprentices, they offer rigorous, high-quality career pathways that start with work experience and occupational skills and lead to rewarding careers. For educators (or educational institutions), they offer sufficient scale and close connection between the academic content of apprenticeships and current and future employer needs. While registered apprenticeship programs have operated for more than 80 years in the United States, the effort to create new apprenticeship models has taken on new energy in recent years. In addition, emphasis on youth participation in apprenticeships has increased. Success in expanding the scale and scope of apprenticeships in the US will require attracting large numbers of employers to create programs and offer apprenticeships. In this brief, we examine the success of a sustainable industry consortium model that has been replicated in a number of US communities.

Using the Apprenticeship 2000 consortium as a case study, this brief examines the efficacy of the consortium model in supporting the success of apprenticeship programs. Apprenticeship 2000 has been training youth for in-demand manufacturing occupations for over 25 years, presenting an opportunity to understand what makes a program long lasting. First, we examine the consortium model and review

its benefits and limitations. We then explore how Apprenticeship 2000 has evolved, why it works, and why it helps employers start and sustain apprenticeship programs. We conclude by presenting lessons that can inform programming for sustainable apprenticeships.

Understanding the Apprenticeship Consortium Model

Apprenticeship 2000 is widely considered the longest-running registered apprenticeship consortium for youth in North Carolina.¹ When it formed in 1995, the consortium model’s benefits were not entirely clear, and its popularity was not a given. Today more than 25 apprenticeship consortia operate across North Carolina (figure 1). The growth and rise in popularity of the consortia model owes much to Apprenticeship 2000 and its pioneering experimentation and success. Indeed, according to leaders from ApprenticeshipNC,² many of the programs operating today have been directly supported by Apprenticeship 2000 or influenced by its model. Apprenticeship 2000’s legacies are its lifespan (over 25 years) and its influence on the many new consortia that have followed in its footsteps.

FIGURE 1
Map of Apprenticeship Consortia in North Carolina



- | | | |
|---------------------------------|---|--|
| 1. Apprenticeship 2000 | 13. Career Accelerator Program (CAP) | 19. North Carolina Triangle Apprenticeship Program (NCTAP) |
| 2. Apprenticeship 321 | 14. Catawba Construction | 20. RockaTop |
| 3. Apprenticeship Caldwell | 15. Charlotte Executive Leadership Council (CELC) | 21. South Piedmont Community College |
| 4. Apprenticeship Catawba | 16. Davidson and Davie Apprenticeship Consortium | 22. Stanly Youth Apprenticeship Partners |
| 5. Apprenticeship Charlotte | 17. Guilford Apprenticeship Partners | 23. Students of Furniture Apprenticeship |
| 6. Apprenticeship Cleveland | 18. Learn and Earn Apprenticeship | 24. Tradesformers |
| 7. Apprenticeship Henderson | | 25. Wake Technical Community College |
| 8. Apprenticeship Johnston | | 26. Wayne Community College (IMTAP) |
| 9. Apprenticeship Montgomery | | |
| 10. Apprenticeship Randolph | | |
| 11. Apprenticeship Wilkes | | |
| 12. Cape Fear Community College | | |

Source: Urban Institute.

What Is an Apprenticeship Consortium?

An apprenticeship consortium is a collaborative partnership in the administration and execution of registered apprenticeship programs by which the members benefit through shared resources. Consortia are typically led and/or staffed by members of the partner organizations, which may include employers, colleges, industry associations, nonprofit organizations, labor unions, or other jointly operated organizations. Each consortium can be organized differently depending on the partners involved, but according to ApprenticeshipNC, there are two general categories into which different consortia can be grouped, depending on the makeup of the partners and the specific goals of the collaboration. As categorized by ApprenticeshipNC, consortia include “industry sector consortia” and “workforce development consortia.” A clear way of determining which category a consortium belongs to is to ask whether it was formed to create a talent pipeline to meet the needs of a discrete set of employer or industry partners or to scale apprenticeships to meet a larger community’s needs.

An industry-led consortium like Apprenticeship 2000 that was formed by a group of manufacturers falls into the first category. These consortia are created to meet the immediate and future skilled labor needs of a group of employer partners in a sector. These partnerships are usually formed by groups of employers who come together to address shared unmet needs for skilled workers. The partnerships tend to be smaller in scale—in terms of the number of apprentices registered and the number of employer partners involved—than the broader workforce development consortia.

A workforce development consortium, on the other hand, focuses on expanding apprenticeships more generally in a specific community to generate pathways to success for local youth and yield positive returns on investments for the business community. This model usually features high schools, community colleges, local government, local workforce boards, and/or other community-serving nonprofits, who organize and recruit employer partners to accelerate adoption of apprenticeship programs. Workforce development consortia typically represent community investments in the local workforce rather than an attempt to meet the needs of a few specific employers. As such, these consortia, like the [Guilford Apprenticeship Partners](#) and [Apprenticeship 321](#) (both in North Carolina), are typically more expansive than industry-led consortia in several ways: they offer more occupational pathways, have more partners, serve more apprentices, and have more resources for full-time staff focused on growing the apprenticeship programs. Four of the many other consortium models are highlighted in box 1.

BOX 1

Other Configurations of the Consortium Model

High school consortia. In some states (including [Iowa](#)), high schools are increasingly acting as the hubs for apprenticeship activities. In this model, a high school acts as the sponsor of a registered apprenticeship program, coordinating the related technical instruction (RTI) at the school or a local community college, as well as finding employer partners that will provide on-the-job training opportunities (Marotta, Boren, and San Miguel 2020).

Community college consortia. One of the most common consortium models, similar to the high school sponsor model, involves a community college acting as the sponsor and organizing hub for apprenticeships in its community, teaming up with the public school pipeline and local employers. Several consortia in North Carolina fit this model: a community college offers numerous occupational pathways to meet the needs of local employers and teams up with employers to deliver the on-the-job training component of the apprenticeship.

Intermediary consortia. This increasingly popular approach involves an intermediary, like [CareerWise in Colorado](#), acting as the sponsor of a registered apprenticeship program and working to build and coordinate across a network of educators and employers to deliver a quality apprenticeship opportunity (Katz and Elliot 2020).

Business association consortia. In some cases, industry groups, like the [National Restaurant Association Educational Foundation](#), act as coordinating bodies and sponsors of national program standards that can be used by employers in the associated industry and supported by a network of education providers.

What Are Common Traits of the Consortium Model?

Although apprenticeship consortia will have different goals and levels of scale, most share several common traits. A key one is that multiple partners unite and collaborate closely under a single program identity and develop a shared vision for the program. Partners must work together to make collective decisions about the program's standards, marketing, admission practices, what occupations to focus on, and how to provide the appropriate related instruction. In addition, consortia of all types and sizes tend to attract smaller companies that are interested in creating apprenticeship programs to develop a pipeline of skilled talent for their organization but have difficulty sustaining such programs on their own.

How Does an Apprenticeship Consortium Form?

In general, no specific policy regulations govern apprenticeship consortia, nor are there requirements that apprenticeships be organized and managed using this collaborative model.³ As such, apprenticeship consortia grow organically. They often start as informal partnerships before becoming more formalized under a recognizable consortium identity, like Apprenticeship 2000. That said, an apprenticeship consortium will need several critical things to succeed. The first is finding appropriate partners. According to Walter Siegenthaler, a founding partner of Apprenticeship 2000, a consortium will work best with companies that are facing a similar workforce pipeline challenge and have a shared vision that apprenticeship is the right solution.⁴ It is especially critical for the longevity of these partnerships that members share a problem and a common understanding of the solution.

Apprenticeship 2000 was formed out of a need to address a skills gap in advanced manufacturing in North Carolina. Research from the National Skills Coalition shows that communities in every state face a skills shortage and skills mismatch.⁵ Moreover, this shortage is not exclusive to advanced manufacturing, but exists across many skilled fields like health care and information technology.

According to a report from the Business Roundtable, 95 percent of CEOs have difficulty hiring workers with the right skills,⁶ indicating that the labor market shortage is common and makes many companies and communities ripe for an apprenticeship solution.

Another key ingredient for convening companies under the umbrella of an apprenticeship consortium is being aware of and understanding the benefits of collaboration. Some companies might have had difficulties managing apprenticeship programs on their own or might simply have been too small to do so. Steve Rotman explained that when he was looking into the partnership opportunity with Apprenticeship 2000, his company (Ameritech Die & Mold) had already tried to host an apprenticeship program of its own but was not satisfied with the results. Joining the consortium was a game changer for Ameritech, especially for recruiting qualified high school students. Rotman described, “As Apprenticeship 2000 we could tell the schools, students and parents that there are 20 positions available even when Ameritech only needed 1 or 2 new apprentices, this gave us credibility in the school systems that we (Ameritech) would have never gotten on our own.”⁷ The program’s credibility and recognition as a prestigious and desirable opportunity for youth made students more motivated and committed to applying and competing for spots.

The Consortium Model is Less Common

One tradeoff of the consortium model is that the gain from pooling resources comes with a loss of autonomy. This is perhaps why it is not the predominant apprenticeship sponsorship model and why many large corporations choose to manage their own apprenticeship programs rather than join a consortium. In North Carolina, for example, data from ApprenticeshipNC show that of the 12,244 actively enrolled apprentices in the state, only 1,072 are registered with an apprenticeship consortium. This may be due to the customization of the program required to participate in the program or difficulty working under the partnership structure. However, the consortium model is rooted in the idea that when companies work together, they can create better programmatic outcomes than any single company could on its own. In doing so, consortia ease some of the burdens and pressures a company experiences when trying to manage its own program. When these partnerships are managed well, they can spur the creation and scale of apprenticeship programs with more employers and have a greater impact in their communities and industries.

The Case of Apprenticeship 2000

As in other states, apprenticeships have long been used in the construction field in North Carolina. The North Carolina Construction Training Council, created by employers in the construction industry, has offered apprenticeships in several construction trades since the 1960s. In the mid-1990s, North Carolina businesses in advanced manufacturing took a lead in developing apprenticeships, and in 1995, a group of American, Austrian, German, and Swiss manufacturing companies with locations in rural areas outside of Charlotte came together to start an apprenticeship consortium.⁸ They **transformed from competitors to collaborators** to address common problems they were facing: talent shortages, a skills gap, and employee turnover. Their motivation was to resolve issues in workforce development.

Importing skilled employees from Europe or even North America was not cost effective, nor was it a viable long-term solution, so they used their personal knowledge and experience of being apprentices to create a youth apprenticeship program.

BOX 2

Evolution of Apprenticeship 2000

Apprenticeship 2000 partners with local high schools and Central Piedmont Community College (CPCC) to offer apprenticeships to youth in four occupations in advanced manufacturing: computer numerical controlled machinist, tool and die maker, mechatronics technician, and injection molding technician. Students graduate the four-year apprenticeship program with an AAS degree in mechatronics engineering technology from CPCC and are certified by the state of North Carolina and the US Department of Labor.^a Twenty-five years in the making, Apprenticeship 2000 remains a standout among youth apprenticeship programs in the United States. (The “2000” refers to the year of the program’s first graduating class of apprentices.) The program’s success has sparked the creation of more than 25 consortia (with expanded industry sectors and occupations) in North Carolina, and it works closely with ApprenticeshipNC, the state’s apprenticeship program, to share best practices with other programs.

^a“About us,” Apprenticeship 2000, accessed August 2020, <http://apprenticeship2000.com/zwp/about/>.

Apprenticeship 2000 was created by Ameritech Die & Mold (an American company), Blum (Austrian), Daetwyler (Swiss), and Sarstedt (German). When Rotman and his partners moved Ameritech from Michigan and Ohio to North Carolina, they were surprised to encounter a **shortage of talented employees**.⁹ Whereas the Midwest had been a strong manufacturing hub since the late 1800s, with a high concentration of skilled workers, that was not the case in the South. Initially, Ameritech tried to recruit skilled tradesmen from Michigan and Ohio to relocate to North Carolina to fill their ranks, but soon discovered this solution was unsustainable. Workers who migrated from the North did not stay long, typically returning after a year or two. The constant turnover brought high training costs (to teach new employees the machines and company culture) and also made it difficult to build a cohort of experienced employees.

Similarly, the European companies that had set up shop in the Charlotte area were having trouble finding employees: Siegenthaler, a former vice president at Daetwyler, said the company needed trained technicians for its service department who could install and maintain equipment that was manufactured in its headquarters in Switzerland and sold in the US. However, finding trained people was challenging. Its initial solution was to bring in service technicians from Switzerland. Siegenthaler then met Karl Rudisser, a former general manager at Blum, an Austrian company that needed technicians to maintain its fully automated production line. Blum too had initially brought in technicians from Europe. Very quickly, they all realized that importing skilled workers was not a long-term solution.

“If you can’t find people with the right skills, you have to grow them yourself.”

–Walter Siegenthaler, former vice president, Daetwyler

Prior to 1995, as former apprentices themselves, the managers of Ameritech tried to start apprenticeship programs at their own company. The problem was they only needed one or two apprentices a year, and the employers they initially approached about participating in the program were skeptical about the benefits of apprenticeships. Another hurdle was the **lack of awareness among high schools of the value of apprenticeships**. Schools did not know much about apprenticeships and thought of them as, in Rotman’s words, a “third hand stepping stone” for students. They sent the employers students who were performing poorly academically and who had slim chances of getting into college. Because of the demanding nature of apprenticeships, student apprentices’ lack of preparation led to high dropout rates from Ameritech’s apprenticeship program. (The European companies had similar struggles with schools.)

Another obstacle the employers encountered was the belief that college is the first and only option for students. This is the predominant mindset of students, parents, and counselors in the United States and leads them to believe that a college education is a prerequisite for entry into decent jobs; indeed, students who do not go to college are stigmatized by society (Agovino 2019). But in North Carolina, the pipeline to college is “leaky”: only 16 percent of ninth-graders in a 2008 cohort successfully completed in-state postsecondary education at a community college or the University of North Carolina (UNC), and most exited school during the transition from high school to college (Tippet and Stanford 2019).¹⁰ Despite the talent shortages that employers were experiencing, the focus on college education was leading to an undervaluing of alternate career pathways.

The North Carolina Department of Labor introduced Rotman (Ameritech) to Siegenthaler (Daetwyler) and Rudisser (Blum), who were eager to work together. Rotman brought new energy and the experience of previous failures with apprenticeship programs to influence and drive the program’s design. The approach involved **complementing the apprenticeship program with an associate’s degree** in mechatronics engineering technology from Central Piedmont Community College. The program’s high school apprentices would become dually enrolled at CPCC, earning multiple college credits while still enrolled in high school. According to the employers, the college degree was a big draw for parents and students and soon became a selling point for the program. In addition, parents were persuaded by the scholarship and awards that the program gave to pay for students’ tuition and books. This set the ball rolling to formally establish Apprenticeship 2000 in 1995.

BOX 3

Components of Youth Apprenticeship Programs

Youth apprenticeships provide work-based learning opportunities for students and young people ages 16 to 21 in high school and postsecondary education. Apprenticeships combine academic and technical instruction with paid work experience across many sectors, such as information technology, health care, and energy. In a registered apprenticeship program, apprentices can gain a federal certificate of completion, a professional network, and valuable skills that can help them find high-paying jobs.

A youth apprenticeship program has five key components:

- **A paid job.** Apprenticeships are paid jobs. Employers provide competitive and progressive wages to apprentices during their training.
- **On-the-job learning.** Apprentices gain practical and “hands-on” experience in collaboration with a mentor. On-the-job training through youth apprenticeship programs must last at least 12 months and is further defined through regulation by the US Department of Labor in collaboration with business and industry.
- **Classroom learning.** A youth apprenticeship program offers theoretical instruction or “classroom instruction” involving how to perform an occupation more broadly. This may be provided by an educator provider or by the company via a high school, college, or online provider.
- **Mentoring.** Apprentices are provided guidance and advice on the job by an experienced professional to teach them the occupation, the company’s business practices, company culture, employment skills, and other knowledge required to become proficient in the occupation.
- **National credential.** The Certificate of Completion of an Apprenticeship program is awarded to people who complete registered apprenticeships, either by the US Department of Labor or a state apprenticeship agency. It indicates proficiency in the occupation and is nationally recognized and portable.

The duration of an apprenticeship program can vary by industry sector, employer, and complexity of the training. Apprenticeship 2000 programs last four years, and upon completion, apprentices earn an AAS degree in mechatronics engineering technology from CPCC and are certified by the state of North Carolina and the US Department of Labor.^a

^a“About Our Program,” Apprenticeship 2000, accessed August, 2020, <http://apprenticeship2000.com/zwp/about/>.

Innovations That Improved Apprenticeship 2000’s Quality and Longevity

One of the first innovations that Apprenticeship 2000 implemented was to make entry into the program challenging. It set up a competitive process in which students knew they had to do well in school and have a good attendance record to be selected. The result was a culture of excellence around the program and its brand, which helped attract strong candidates with a passion and commitment to learning and an aptitude for mathematics and engineering. This **selective recruitment strategy** meant that students earned the position rather than being given it. At Olympic High School, one of the schools that Apprenticeship 2000 recruits from, more than 100 students a year indicate their interest in an apprenticeship track, but companies only select 60 for a “tryout,” according to Mike Realon, the school’s career academy development coordinator.¹¹ The “tryouts” consist of four afternoons during which

students tour the companies, shadow journeyworkers (professionals at the company), and see the work being performed in advanced manufacturing. Even fewer students are selected for six-week “internships” or pre-apprenticeship programs, during which they are placed with different employers in the consortium and work in teams to creatively solve challenges. This period gives them a preview of what the on-the-job training looks like and gives employers the opportunity to find a good fit for an apprenticeship—with both students and companies making decisions. At the end of this six-week period, a select few students are offered apprenticeships with companies in the Apprenticeship 2000 consortium. The advantage of this model is that students have multiple employers to select from, and if the openings in one company are filled, eligible students can work with others.

In addition to this competitive process, companies participating in Apprenticeship 2000 invite parents, teachers, and career counselors at local schools to tour their facilities. The advanced manufacturing facilities and modern workspaces help persuade parents, educators, and students to give apprenticeship a chance. Both strategies—creating a competition for students and informing educators and parents—created a **change in attitude toward apprenticeships** in the greater Charlotte area. They were no longer seen as second or third options for students who could not get into college but as desirable career pathways that students could *choose* to participate in. The other turning point for smaller companies including Ameritech and Daetwyler was that they were able to approach schools as Apprenticeship 2000 to recruit a cohort of students for all of the participating employers. The consortium’s scale and this **collective identity** gave it credibility in the school system and opened doors that were closed when apprenticeships were not taken seriously.

“[Apprentices] are much more successful. They have been preselected, so they have certain GPAs, certain attendance records. They have been assessed and hired based on a certain number of competencies and qualities that the general student population does not [have]. [Apprentices] have the motivation and structure that these employers put in place on top of that. And so, they have that golden ticket ... By many measures they are elite students.”

—Chris Paynter, dean of educational partnership, Central Piedmont Community College

Central Piedmont Community College has been in partnership with the Apprenticeship 2000 program since 1995 and has worked with the employers to keep the classroom instruction up to date with changes in the industry. Another innovation in program design involved **creating a new mechatronics engineering technology track** (which combined mechanical engineering and electronics) and ensuring its sustainability by adapting curricula to focus on advancements in automation that corresponded with the industry sector. Staff from CPCC even traveled to Austria, Germany, and Switzerland to receive professional development and learn more about how the companies develop

their apprenticeships at their headquarters. In the past 25 years, CPCC has overhauled its curricula four times to ensure classroom learning aligns with on-the-job training, and importantly, the timing of *when* the academic content is delivered so that it is in sync with the job training. Apprentices reported that they were able to transition seamlessly between the classroom and workplace. The ability to understand and directly relate academics to their work set them apart from their peers in the community college who were not in the apprenticeship program. Such **connected training** ensures that education is proactive in meeting the needs of the employers, relevant to workers, and directly connected to the labor market.

The consortium model also allows for scale. Apprenticeship 2000 sends, on average, 15 to 20 student apprentices to CPCC every year, allowing CPCC to reach operational efficiency. Because of this efficiency, CPCC was able to build a **dual enrollment path for students** in the mechatronics engineering technology program and sustain it over the long term. When they complete the apprenticeship program, apprentices earn an associate's degree in applied science. In 2012, CPCC became the first community college in the US to offer world-renowned IHK-certified training courses in mechatronics and other areas.¹² In 2018, it was awarded a \$2.5 million Trade Adjustment Assistance Community College and Career Training grant from the US Department of Labor to increase the number of students earning the industry-recognized mechatronics credentials.¹³ The grant also created space for innovation in a large digitization effort for augmented reality and enriched simulations, so students use the flipped classroom to learn off campus. These strategies, listening to employers and working with them to keep the curricula updated, and embracing digital platforms (which have been critical during the COVID-19 pandemic) have proven to go a long way in creating sustainability for both the community college and the Apprenticeship 2000 consortium.

Apprentices who participated in Apprenticeship 2000 reported that the program was their top choice for postsecondary experience.¹⁴ The fact that they saw it as a valuable opportunity elevated and motivated the best students to apply themselves. Even in the apprenticeship program, internal competition among apprentices is strong. At Blum, all apprentices compete in academics and job performance to be selected for a paid summer exchange at Blum headquarters in Vorarlberg, Austria, when they graduate. If their grades slip, the company intervenes by providing **peer mentoring and tutoring** (from peers from the same cohort or those more advanced in the program) and increased supervision from their supervisor and/or mentor. The companies' apprenticeship managers are also in constant contact with the apprenticeship liaison at CPCC and with the instructors as needed. We found that mentoring in Apprenticeship 2000 often goes beyond the workplace and academics to incorporate essential employability skills. Apprentices highlighted learning about key oral and written communication skills, being a team player, time management, and financial skills. This type of **hands-on support and investment in student well-being** helps set apprentices up for success (see Jacoby and Haskins 2020). To help apprentices get value out of the program, it offers financial rewards and personal and professional growth opportunities. One former apprentice told us, "They [the employers] gave you responsibility from day one, and it's yours to do with it as you like. It made you want to shine." Apprentices are given opportunities to have a secure job, to earn a college degree without debt, to have a platform for financial security, and to potentially own a home at a young age.

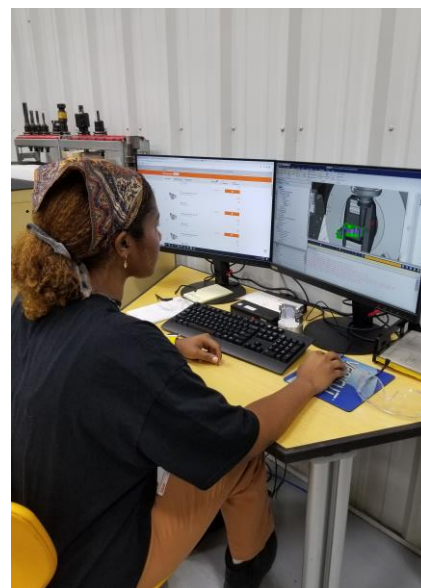
The apprentices who have been successful in Apprenticeship 2000 were top students and had the option to go to college, but saw the brightest path in the apprenticeship program. Jordan Pounds, a first-year apprentice, explained, “I explored my options between going to four-year university to pursue a degree and the apprenticeship program. And the apprenticeship program had the most ‘pros’.” Other apprentices concurred that the hands-on experience they were receiving was invaluable to their career growth. Pounds was the only woman in her cohort, but that did not deter her because she was used to being the one of the few young women in engineering classes throughout her time in high school. Although her optimism and cheerfulness are admirable, advanced manufacturing is a field in which very few women and women of color like Pounds work as technicians. Structural inequalities related to race, ethnicity, and gender (among other factors) that limit labor efficiency are usually also found in Apprenticeship 2000, although to a significantly lesser degree. From our observations of Apprenticeship 2000 and other North Carolina consortia, the model appears to be more adept at anticipating and ameliorating societal barriers that limit success. The employers participating in Apprenticeship 2000 are committed to increasing diversity and go beyond gender stereotypes in math and engineering by persuading young women to try out careers in these fields through apprenticeships.

BOX 4

Apprentice Spotlight: Jordan Pounds and the Future of Apprenticeship 2000

Jordan Pounds (pictured right) is currently 18 years old and entered the first year of her apprenticeship with Blum in the fall of 2020. Like many apprentices who started with Apprenticeship 2000, Pounds is excited about the opportunity and what the future holds for her at Blum. Pounds described her prospects for her future with a wide smile, telling us in a virtual September 2020 interview, “I definitely think this apprenticeship program will help me with my career because I am building it right in front of my face. I am working here at Blum and I plan on staying here for a long time. I am working with people in different departments and I am getting those different technical skills and on-the-job training to further my career at Blum.”

The fact that Pounds sees such an opportunity for a long-term career at Blum explains why students like her consider an apprenticeship their best option. Indeed, Blum’s retention rate of former apprentices is high: 75 percent stay for more than five years after completing their apprenticeship. If Pounds furthers this trend, she could be at Blum many years to come and contribute to the future of Blum’s US operations.



During the pandemic, the Apprenticeship 2000 program has helped some apprentices maintain **stability** for themselves and their families. A fourth-year apprentice at Blum told us that both of his

parents were furloughed without pay. But this apprentice got paid through his apprenticeship at Blum, which allowed him to help his family feel secure during the pandemic. In the US, working youth ages 16 to 24 are more vulnerable during economic recessions than the adult population because of the industry sectors they are employed in, the types of work they perform, and the high rate of youth unemployment. Nearly half of employed youth work in leisure, retail, and hospitality sectors, in jobs that are seasonal, temporary, and insecure, where they are provided no benefits and face greater risk of unemployment.¹⁵ The unemployment rate among young people is two to three times higher than among adults (Inanc 2020). And in times of economic hardship, young people are more likely to have their hours cut or be laid off than adult workers. These trends have been exacerbated during the COVID-19 lockdown because most of the work in the service industries cannot be done from home.¹⁶ Youth apprenticeship programs such as Apprenticeship 2000 can address economic vulnerability among youth not only by helping them build skills, but also by setting them on a stable pathway to good jobs with job security, reliable pay, worker protections, and prospects for career advancement.

Both employers and apprentices report that the program has been transformational. Maintaining this value proposition, especially for the apprentices, has been a key factor in the program's success and in creating the **strong pipeline of talent that the companies can retain**. According to Andreas Thurner, apprenticeship manager at Blum, more than 65 percent of the technicians currently employed at the company went through the Apprenticeship 2000 program.¹⁷ Another key reason for the employers to invest in the program is to avoid the costs of recruitment and retraining that results from high turnover. The cost of recruitment is very high and most small companies do not have the luxury of time or money to spend on retraining. When one company faced a leadership vacuum, its CEO advanced two former apprentices that had remained with the company after completing the apprenticeship program. Between them, the former apprentices had 13 to 14 years of experience at the company. They not only rose to the challenge but proved very successful according to customer feedback. Companies that promote from within save on retraining new employees and have little to no disruption of service to customers, which is important for small and lean companies. **Advancement from within a company also creates a talent pipeline** that ensures continuity and the company's success, and the employer consortium model equalizes this opportunity for small and large companies.

“The Apprenticeship program is a succession plan. You’re creating the next [generation] of people that will have the desire to carry on with the company as long as you invest in them and give them the opportunities to grow. They will be there for the events that the company is going to require as it matures.”

—Steve Rotman, president, Ameritech

Lastly (and importantly), the employers participating in the Apprenticeship 2000 consortium believe that **investing in the local community and developing their own sustainable workforce solutions** have been critical to the success of the program and their companies. One such example is innovation: continuous innovation and critical thinking are key elements of technological workplaces, and they ensure machines keep running and save time and money. Minh Tran, a Blum apprentice, proudly shared an example with us: “For improving one of the tools we use, me and Nick [another apprentice] came up with an idea to create a mechanism [for a smooth process flow] and we won an internal competition for our improvement. Now our mechanism is used in all of the shops.”¹⁸ The importance of such innovations is reinforced by Helper and coauthors (2016), who studied the costs and benefits of Apprenticeship programs for a diverse set of companies, including Daetwyler with Apprenticeship 2000. The authors highlight how the companies’ improvements in productivity were tied to their apprenticeship programs. They also add, “Daetwyler and the other Apprenticeship 2000 partners believe that they earn back the investment they make during the four years of the apprenticeship or shortly thereafter. Even if an apprentice were to leave the firm after graduating from the program, taking their experience and skills with them, the companies believe that they’ve already earned back a positive return on their investment” (Helper et al. 2016, 60). Furthermore, Lerman (2014) finds that that firms with apprenticeship programs recoup their costs and recognize that investing in training ensures a supply of well-trained workers and a pipeline to fill leadership positions. So, the return on investment according to Rotman is “priceless!”

BOX 5

Seven Factors behind the Success of the Apprenticeship 2000 Consortium Model

Economies of scale and shared identity. The consortium model used by Apprenticeship 2000 works well for small companies that do not have the resources to start apprenticeship programs on their own but benefit from shared resources. A key factor involves a shared group identity that allows Apprenticeship 2000 to offer slots to 15 to 20 apprentices per cohort. This is especially helpful for smaller companies that can support only one or two apprentices a year. The scale the program provides also made it worthwhile for Central Piedmont Community College to create a specialized curriculum and keep it updated.

Culture of collaboration. Though all the companies in Apprenticeship 2000 are in the manufacturing sector, they recognize the benefits of collaboration over competition. They work together to address their collective talent shortages, and they established clear rules from the beginning for a successful relationship. The partners not only committed to working together but also agreed not to poach talent from each other. Although employers are the linchpins of apprenticeship programs, collaboration extends to other critical partners, including educational institutions (high schools and community colleges) and state and local agencies that support programs.

European businesses. Most of the original companies that came together to form the apprenticeship consortium were from Austria, Germany, and Switzerland. In these countries, apprenticeships are part of the workforce development DNA.

Past apprenticeship experience. A factor in the program’s sustainability is that the leaders of its four original companies were all apprentices when they were young. Starting an apprenticeship program was a familiar option because of their experiences.

Dedicated staff. Designating staff to apprenticeship programs is a key factor in sustainability. Each employer in the consortium has an apprenticeship manager, and the community college also has an apprenticeship liaison who works with employers. This is key to keeping the program's curriculum up to date and meaningful.

Innovation. As a consortium, Apprenticeship 2000 can drive and develop the program's design to suit companies' needs. The companies combined mechanical engineering and electronics to create a degree program in mechatronics at CPCC and worked with the college to develop a curriculum for it. Over the years, they have worked with CPCC to keep up with changes in technology and market needs.

Productivity and return on investment. Because of their own experiences with apprenticeships, the founding partners had little trouble realizing that apprenticeships are long-term investments, and they knew that apprentices contribute to productivity even while in an apprenticeship program.

Limitations of the Program

Apprenticeship 2000 is a selective program and is still small in scale. Over the past 25 years, 930 students have shown interest and participated in orientation activities, but only 327 have been hired. Of those, 198 have completed the program. In off-the-record comments from stakeholders familiar with apprenticeships in the state, we learned that the program's selectivity and rigor have at times been perceived unfavorably by manufacturers that did not agree with the standards and the costs (\$175,000 to \$180,000 per apprentice over four years, or approximately \$43,000 per year) of apprenticeship programming. In some cases, manufacturers interested in apprenticeships, like Siemens, elected to join other consortia or run their own programs.¹⁹

Selective apprenticeship criteria based on low absenteeism (a metric of work ethic important to employers) and grades rule out some students who could benefit from apprenticeship programs. For instance, National Assessment of Educational Progress data from 2015 showed that students with disabilities, students from low-income households, Hispanic English-language learners, and Native American students were more likely to be absent and perform poorly in school (Garcia and Weiss 2018). Students with soft skill deficits, which are often subjective and can create artificial barriers to employment, are also at a disadvantage in the apprentice hiring process. Moreover, some apprenticeship programs require that students have specific class credits to apply, and the cost of such credits can be a barrier to students with low incomes who would otherwise be a good fit (Freyer, Forbes, and Howze 2019). Like all employers, the manufacturers in the Apprenticeship 2000 consortium want apprentices who are most likely to succeed and to be productive. Overcoming these barriers with effective programs (such as pre-apprenticeships) that can help students build the requisite essential skills can help with their success in apprenticeship programs.

As the leaders of the Apprenticeship 2000 companies would readily admit, their model solely focuses on success in advanced manufacturing apprenticeships rather than scaling to include other occupational pathways. Moreover, Apprenticeship 2000's focus on mechatronics, an occupation dominated by men, may also lead to a lack of gender diversity (Hale 2013). Though there is a dearth of systematic demographic data collected by the program, we came to understand that it is not common

for young women to apply. This was an area in which Thurner and Siegenthaler had made their recruiting efforts more inclusive, but they told us they had not succeeded to the extent they had hoped. Thurner explains, “I am all for getting girls into this training. Overseas, the percentage of girls is reaching 20 percent now in Blum in Austria...You cannot imagine how I push for girls to enter this program.” However, what he encounters is a cultural mindset which leads few girls in grade school and few young women in high school and postsecondary education to pursue an education in math and science (Hill, Corbett, and St. Rose 2010).

Furthermore, the same rigor and selectivity that the program has been critiqued for has led to low dropout rates. Its dropout rate since its inception has been roughly 39.5 percent. Comparatively, national dropout rates (i.e., rates of noncompletion) for registered apprenticeships is roughly 50 percent, and the dropout rate in community colleges is 60 percent.²⁰ The success of the Apprenticeship 2000 consortium comes from having systems in place to build and adapt the curriculum to technological advancements in the manufacturing sector, a committed group of employers, developing the critical-thinking skills of apprentices in the on-the-job training, and providing strong mentoring and supportive services to apprentices. Thurner asserts, “Blum students trained in our apprenticeship program are better than their Austrian counterparts because we have a stronger curriculum. The content of our classes is way higher, and we have a smaller ratio of students to trainer here, so we’re in a win-win situation here. [I’m] not sure if we can maintain the high quality if we were to scale up.” Despite Apprenticeship 2000’s limited scale, it has been sustainable and has spurred other industry sectors to create their own consortia. Its leaders not only share their “secret sauce” for success with other consortia, but help them overcome challenges using best practices.

Creating Sustainability in an Apprenticeship Consortium

Apprenticeship 2000’s experience shows that creating and maintaining a successful consortium partnership does not happen by accident. The strong relationship and bond created between the companies that formed Apprenticeship 2000 required a lot of trust and nurturing to sustain a 25-year relationship. Indeed, Apprenticeship 2000 incorporated important relationship building activities and established work-related cultural norms that have provided for long-term success. To achieve similar sustainability, apprenticeship programs can take the four critical lessons that follow from Apprenticeship 2000.

Establish a unified purpose. The initial companies created a shared vision for all of the companies that subsequently participated and created a common framework that all parties could understand and follow so that everyone knew the “rule of the road.” Siegenthaler explains, “Working together is a matter of willingness. If the companies involved are really willing to do it...and we were all looking for the same result, that’s how it work[s].” For example, the partner companies agreed to never poach talent from one another. Instead, they agreed to work together to recruit talent, and if an apprentice does not fit or is not satisfied at one company, they have the option to join another company in the consortium that requires an apprentice. Moreover, their common recruitment strategy benefited all companies involved. Siegenthaler explained how a former partner company that tried to work with Apprenticeship

2000 did not have the same common understanding: “We had a European partner company but for some reason it did not work. They did not have the same interest. They did not seem to be on the same level. They decided on their own that this was not for them.” In this way, just like any meaningful relationship, the need to ensure that common understanding has been crucial to Apprenticeship 2000’s longevity.

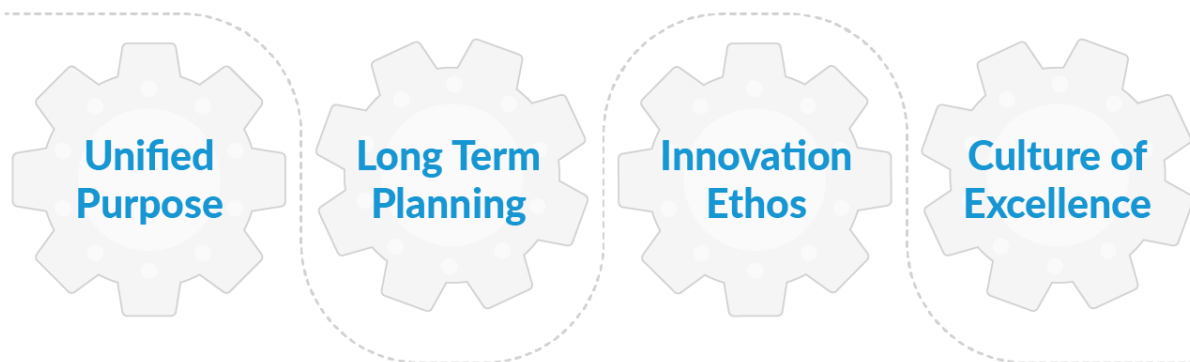
Plan for the long term. Apprenticeship programs often require long-term planning to help businesses prepare for current talent shortages and future workforce needs. The idea of long-term planning was echoed in various forms by the program’s leaders, who considered it a major factor in creating a sustainable relationship. Chris Paynter, dean at Central Piedmont Community College, said of the program, “They have a plan and they stick to the plan. It’s very easy to follow ... Everyone knows what’s expected of them. The partner companies understand the playbook.”²¹ Moreover, it is not just the development of the plan that supports the consortium, but the systematic planning and regular pulse checking that happens with the apprenticeship partners. In addition to meeting quarterly, the partner companies also create opportunities for other stakeholders to join, including CPCC educators and North Carolina apprenticeship officials.

Create an ethos of innovation. Apprenticeship is a real-time training strategy for companies that require their workers to understand and use the latest technology and techniques. Despite a growing body of evidence that community colleges on their own may be less responsive to the labor market,²² Apprenticeship 2000 activated its close relationship with CPCC to provide apprentices the latest training in the classroom. During the past 25 years, CPCC made four broad changes to the classroom curriculum. However, these changes were led by the partner companies’ influence on CPCC—to create a new degree from the previously delivered manufacturing technology degree. As Paynter explains, “The structure [of courses] that they put together did not exist in the North Carolina library of curriculum standards. So, we worked with our colleagues ... to create a new degree called mechatronics engineering technology.” This degree allowed the companies and the apprentices to keep up with changes in automation and technology that were transforming the advanced manufacturing industry. Future apprenticeship consortia should take note and action to ensure that an ethos of innovation is part of the culture and is infused into continuous program development, improvement, and execution.

Create a culture of excellence. The consortium endeavored to change the public perception of apprenticeships from a second-choice career strategy to an “apprenticeship plus college model,” and the fact that the business leaders had themselves started as apprentices helped. To do so, they needed to set a high bar for how they would select apprentices and show the community and students the value of the program. Apprenticeship 2000 requires high levels of academic and personal achievement for students to be considered for employment at the partner companies. A minimum of a 2.6 grade point average is required, as is good performance on other tests and during the summer internship.²³ These requirements allow the companies to select high-caliber apprentices.

Apprenticeship 2000 celebrates and elevates the accomplishments of its apprentices by holding a large annual signing and graduation event for the incoming class of apprentices and new journeyworkers. The event signifies a rite of passage and provides parents, families, and friends the chance to witness and

share in the significance of the young apprentices' achievements. The event is the largest annual expense that the consortium pays for, symbolizing the importance of the ceremony. Graduating apprentices are celebrated in a similar fashion to graduates of other higher education institutions and receive an associate's degree in mechatronics engineering technology. We found that the apprentices (and parents) were highly satisfied with their career decision. As Pounds (a Blum apprentice) explains, apprenticeship is "better than going off to a four-year school where you are just in school ... you usually don't have the job in the field that you're going into school for." She added that she, like all of the apprentices at Blum, also appreciated that they received "free college" in addition to the guaranteed job.



The above four strategies, when employed in unison, work together like a well-oiled machine and have helped keep Apprenticeship 2000 running smoothly for more than 25 years. Although the strategies are not exclusive to the consortium model, Apprenticeship 2000 shows that they can be employed particularly well by consortia, namely because the consortium model is rooted in partnership and in the idea that companies that work together can create better program outcomes than any single company could on its own. When incorporating the four strategies detailed above—that is, unified purpose, long-term planning, an ethos of innovation, and a culture of excellence—sustainability becomes part of the fabric of the consortium model. As such, a consortium can ease some of the burdens and pressures a company can experience when managing a program on its own. When these relationships and partnerships are tended with care, as has been the case with Apprenticeship 2000, they can have a lasting impact on employers, apprentices, and entire communities.

BOX 6

Youth Apprenticeship Intermediary Project: Case Studies

The Urban Institute's [Youth Apprenticeship Intermediary](#) project is funded by the US Department of Labor to expand youth apprenticeships, raise awareness of their potential to connect young people to promising career paths, and help employers meet their talent needs. The Urban team will capture promising practices in yearly case studies that highlight prominent youth apprenticeship models, programs, and initiatives. This brief is part of this larger series and illustrates what it takes to maintain a high-quality apprenticeship program over time, as Apprenticeship 2000 has been able to do in its more than 25 years of continuous operation.

Notes

- ¹ The terms “registered apprenticeship” and “registered apprenticeship program” are often used interchangeably in the field.
- ² ApprenticeshipNC is an entity within North Carolina’s community college system tasked with supporting and expanding apprenticeships in the state.
- ³ Sponsors of consortia models are still responsible for keeping records, ensuring the safety of apprentices, and establishing the standards by which all will participate—as is the case for any apprenticeship sponsor. See the US Department of Labor’s [frequently asked questions](#) about apprenticeships.
- ⁴ Walter Siegenthaler, virtual interview with the research team, August 2020.
- ⁵ <https://www.nationalskillscoalition.org/wp-content/uploads/2020/12/US-Skills-Mismatch-Fact-Sheet-2020.pdf>
- ⁶ This information is based on the report from the Business Roundtable which cites interviews with CEOs about the difficulty of finding workers with the skills needed to perform the job they are being hired to do. See “Workforce Spotlight,” Business Roundtable, accessed February 3, 2021, <https://www.businessroundtable.org/policy-perspectives/building-americas-tomorrow-ready-workforce/closing-the-skills-gap/workforce-spotlight>.
- ⁷ Steve Rotman, virtual interview with the research team, August 2020.
- ⁸ A driving force of globalization, foreign direct investment (FDI), deeply impacts growth, innovation, and employment and wages for people, states, and national economies. This is particularly true of FDI investments in North Carolina, which receives the third largest amount of FDI in the US. In 1997, foreign-owned affiliates provided 7.3 percent of the state’s total employment (all sectors), of which 13 percent was in manufacturing (NC Secretary of State 2000). By 2017, jobs created by FDI still only generated 7.5 percent of the state’s total employment (compared with 5.5 percent of total jobs in the US; see this 2014 article from the Brookings Institution), but employment in the manufacturing sector increased exponentially, by 123,100 workers or 44 percent of all jobs created by FDI (see [this fact sheet](#) from the Global Business Alliance). One of the big draws for foreign-owned businesses to set up shop in North Carolina is the tax benefits provided by the state and local governments. Other advantages are regulatory navigation, workforce solutions, and incentives provided by the state ([EDPNC 2017](#)).
- ⁹ American Die & Mold was founded in 1985 by Ronald Wozny, Richard Wozny, and Steve Rotman. They operated in Michigan and Ohio and moved to North Carolina because they saw a need for skilled trades and mold makers in the South.
- ¹⁰ The data only track students who went to a North Carolina community college or UNC, and do not track those who went to private colleges in the state or to an out-of-state school. Despite this, it is useful to consider that 22 percent dropped out of high school or took longer than four years to graduate, 43 percent graduated from high school on time but did not enroll at a North Carolina community college or UNC, and 20 percent enrolled at a North Carolina community college or UNC but did not take the usual amount of time (three and six years, respectively) to graduate.
- ¹¹ Mike Realon, virtual interview with the research team, August 2020
- ¹² IHK-Karlsruhe is a regional chamber of commerce and business in Germany. See Ken Elkina, “Central Piedmont Community College to certify students for German companies in Charlotte region,” Charlotte Business Journal, April 17, 2012, <https://www.bizjournals.com/charlotte/news/2012/04/17/central-piedmont-community-college-to.html>.
- ¹³ “Mechatronics Re-Envisioned,” NC State Industry Expansion Solutions, December 6, 2018, <https://www.ies.ncsu.edu/success-story/mechatronics-re-envisioned/>.
- ¹⁴ Apprenticeship 2000 apprentices, personal communications, August 2020.
- ¹⁵ Of the 19.3 million youth ages 16 to 24 who are employed, nearly 50 percent (or 9.2 million) work in the services sector, which is vulnerable to economic exigencies. Nearly one-fourth of the workers in high-risk industries are

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About the Authors

Bhavani Arabandi is a senior research associate in the Center on Labor, Human Services, and Population at the Urban Institute. She is a labor sociologist whose work focuses on enduring inequalities in the labor market, gender, apprenticeship, and international development. Her expertise is in program design and implementation, qualitative methods research, policy analysis, and technical assistance. Arabandi has a MSW from the Tata Institute of Social Work, Mumbai, and grassroots experience working with women’s groups in rural India. She also has a MA in sociology from George Mason University and a PhD in sociology from the University of Virginia.

Zach Boren is a senior policy program manager in the Center on Labor, Human Services, and Population, where he leads various apprenticeship-focused projects and is a technical expert on Registered Apprenticeship and equal employment opportunity. Before joining Urban, Boren spent 11 years at DOL, where he directed Registered Apprenticeship and policy. Boren worked with the US Coast Guard on congressional affairs and on Capitol Hill. An Indiana native, Boren earned a BS in public affairs from Indiana University and an MA in congressional and presidential studies from the Catholic University of America.

Andrew Campbell is a Policy Program Associate in the Research to Action Lab, where he works on a range of projects related to advancing economic mobility through work. Andrew is passionate about translating policy research into actionable takeaways that can help support improved decision making and unlock the power of policy to make a real difference in people’s lives. Andrew earned a MPP from the University of Edinburgh and a BA in Political Science from the College of Wooster.

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500 L'Enfant Plaza SW
Washington, DC 20024

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