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## Building a 21st Century Workforce

*By Gene Bowman*

### THE ALAMO ACADEMIES

Creating a skilled and educated workforce is the vision of the Alamo Academies, a nonprofit based in San Antonio, TX, aimed at offering tuition-free career tracks for high-demand STEM occupations. The Alamo Academies program was the recipient of the 2014 IEDC Gold Award in the Human Capital category for its outstanding accomplishments in building a strong, educated workforce for its community.

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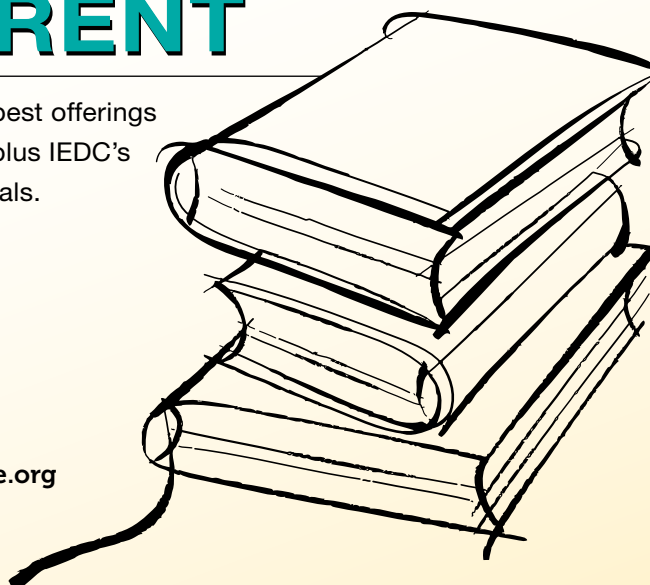


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# building a 21st century

## WORKFORCE

By Gene Bowman

**T**raining the next-generation workforce to meet the demands of an increasing science- and technology-based economy is the vision of the Alamo Academies. The national award-winning STEM (Science, Technology, Engineering and Mathematics) based instructional model has been operated by the Alamo Area Academies Inc. since 2001. The San Antonio-based non-profit entity in partnership with industry, Alamo Colleges (a community college system serving the San Antonio, TX, metropolitan area), high schools, and the municipalities of San Antonio, New Braunfels and Seguin offers tuition-free career tracks for high-demand STEM occupations.

The Alamo Academies is lauded as a highly successful model of “Higher Education Career Academies” focusing on four key industries in San Antonio: Advanced Manufacturing, Aerospace, Information Technology, and Health Care. The program provides a college pathway for high school juniors and seniors to attain industry and academic certificates that further their higher education and the opportunity for high-wage jobs. The Alamo Academies consists of six full-time staffers who oversee the entire program. Numerous professors and instructors teach the courses at the Alamo Colleges campus. Additionally, a board of directors aids in advising the staff.

The Alamo Academies history dates back to 1995, at which time the Base Realignment and Closure (BRAC) Commission closed Kelly Air Force Base. Some of the workload was outsourced or privatized by the Clinton administration to defense contractor companies such as Lockheed Martin and Boeing. The Alamo Academies supported the region’s ability to meet challenges generated from



Alamo Academies graduate Adam Arroyo (l) and U.S. Secretary of Labor Thomas Perez (r) in a roundtable session during the Secretary’s July 10th, 2014, visit to the Alamo Colleges and the Alamo Academies.

the BRAC decision, helped solve its critical need for college educated high-tech employees, and supported the industries’ ability to compete globally.

Today, the Alamo Academies is addressing the emerging Oil and Gas industry and the demand for heavy equipment technicians via a new academy. In the fall of 2014, HOLT CAT and nearly 20 other heavy construction equipment businesses partnered with Alamo Academies for a fifth Academy in the Oil and Gas industry.

**Gene Bowman** is executive director of Alamo Academies. (obowman@alamo.edu)

### A LEADING WORKFORCE INNOVATION

A report released in 2014 by the Texas Comptroller of Public Accounts states Texas ranked No. 2 in employment in the national technology sector, and outlined the challenges of meeting the increasing demand for a highly skilled labor force. The Alamo Academies is one of the first in the nation to address a region’s lack of high-tech, high-skilled labor or “skills gap” by developing a pipeline of college educated, skilled technicians to staff new

## THE ALAMO ACADEMIES

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jobs and replace an aging workforce in Aerospace, Information Technology (IT), Advanced Manufacturing, and Health Career sectors.

*The National Journal* cited the Alamo Academies as one of the top workforce innovations in the country. The model was recognized and commended by the U.S. Department of Labor, Manufacturing Skill Standards Council, Texas Higher Education Coordinating Board, Texas Governor's Office, the Manufacturing Institute, and the Federal Reserve Bank of Dallas.

### A COLLABORATIVE PROCESS, A UNIVERSAL PROGRAM



*Alamo Academies 2008 graduate Ruby Vega installs final components on a USAF C-5 aircraft engine. She represented the Alamo Academies and Lockheed Martin as a panelist at the Bill & Melinda Gates Foundation Supporting Student Success in Seattle, WA, and also participated at a national press conference by President Obama at Northern Virginia Community College in Washington, D.C.*

The Alamo Academies is a Demand-Based Education Model. The process is triggered by industry engagement and sets target enrollment levels based on projected and quantifiable workforce demand. This is followed by a collaborative process identifying the curriculum, recruitment, matriculation, and support systems utilizing a dual credit career academy model that allows students to complete high school and college graduation requirements in one of the high demand occupations (Aerospace, Advanced Manufacturing, IT, Nursing, and Energy).

Students are bussed daily from their local high schools to the Alamo Colleges campus where they engage in 2.5 hours of instruction needed to complete a one-year technical college program of studies, as part of the Associate of Applied Science (AAS) degree path. During the two-year program, students earn 31-34 college credits at no cost to the student, allowing them to receive both a college degree and high school diploma. Students may earn AAS, Bachelor of Arts (BA) or Master of Arts (MA)

degrees at no cost, through industry tuition reimbursement or scholarships.

A strong cornerstone of the Alamo Academies program is the paid summer internship offered to high school students between their junior and senior years. The eight-week internship is a full-time position that pays participants almost \$3,000. It allows students to "learn by doing," offering a glimpse of the working world and a future career. During this time the student may job shadow, participate in on-the-job training or work with a mentor. It is a unique hands-on experience where students apply what they have learned at school in a real-life job setting.

For employers, the internship is an opportunity to demonstrate the traits of successful employees and familiarize them with their company and the corporate culture. Industry partners who have sponsored internships with the Alamo Academies include AT&T, Boeing, Toyota, Broadway Bank, Chromalloy, StandardAero, Cox Manufacturing, H-E-B, ITM, Karta, Kinetic Concepts, KLN Steel, Lockheed Martin, Pratt & Whitney, Rack-space, Valero, 24th Air Force, CPS Energy, Denim Group, Digital Defense, Hexcel Corp., and the University of Texas Health Science Center at San Antonio. These firms represent multiple industry sectors, including aerospace, aviation, healthcare, technology, financial services, IT/cybersecurity, and manufacturing.

The Alamo Academies program is universal, meaning that it is open to all students who meet uniform standards. To be eligible, students are required to be in good standing, demonstrate they are college ready, and have a desire to participate in targeted occupational pathways. To enrich their high school experience and build teamwork skills, students retain University Interscholastic League (UIL) eligibility and many participate in extra-curricular athletic or academic activities. Upon graduation, students can either obtain a high-wage/high-skill career in a high demand occupation or continue with their higher education pathway and degree studies.



*After two-and-one-half years as a jet engine mechanic and successfully earning two associate degrees, 2009 graduate Lily Ibarra was promoted to a contract negotiator for Lockheed Martin.*



## KEY PARTNERSHIPS DELIVER CRITICAL RESOURCES

The participating partners with the Alamo Academies education system are the key to achieving strong economic growth. The successful model includes student participants from more than 25 local public and private school systems and community stakeholders. The Academies participating partners include:

- Alamo Colleges
- More than 25 Independent School Districts (ISDs), private and charter schools in the academies service area
- More than 100 regional employers in the Aerospace, Advanced Manufacturing, IT, Health and Energy sectors, including Lockheed Martin, Boeing, Toyota, Rackspace, HOLT CAT, and Valero
- Municipalities
- Economic development entities, manufacturing associations, Chambers of Commerce, and organizations such as Port San Antonio and Workforce Solutions Alamo.

Partners contribute more than \$2 million to support operating costs. The Alamo Colleges provide facilities, equipment, and instruction; ISDs provide textbooks and round trip transportation; employers pay their interns' salaries; and municipalities fund the operating costs.

A testament to community support is the City of San Antonio-Alamo Colleges Interlocal Agreement that provides funds annually for Academies operations. The City Council ordinance notes that "The Academies represent a cost-effective economic development investment for the City and also reinforces the stated goals of the City's Strategic Plan for Enhanced Economic Development."

In 2012, Alamo Colleges purchased a \$5.2 million, 40,000-square-foot, state-of-the-art facility and 30 acres from Port San Antonio to house the Academies, however no cash was exchanged. The purchase price is being paid from credits Alamo Colleges earn by the academies' graduation of students during the 20-year life of the loan



U.S. Secretary of Labor Thomas Perez tours the Toyota Advanced Manufacturing Technician Program at Alamo Colleges escorted by Sarah Escobar, an Alamo Academies 2012 graduate.

and meeting the needs of aerospace employers – \$10,000 for Academies new hires; \$2,500 for certifications and 20 percent for grants generated.

This sale/exchange was recognized as the "Commercial Land Deal of the Year" by the *San Antonio Business Journal*.

## MEASURING SUCCESS

Courses offered through Alamo Academies align with the targeted industries that have been identified by the San Antonio Economic Development Foundation (a private, nonprofit organization that assists business and industry in locating and expanding into the San Antonio area), city of San Antonio, Bexar County, and other economic development partners, as areas of focus.

More than 1,000 graduates have received training in high-wage demand occupations during their junior and senior high school years since the academies' inception. The Alamo Academies has a 13-year proven track record of graduates earning a tuition-free, one year Level I Cer-

## PARTNERSHIPS

### ALAMO ACADEMIES: An industry Driven, Higher Education Program of Studies, Workforce and Economic Development Partnership: Solving the School-to-Careers Pipeline!

- The Alamo Colleges
- The Municipalities:
  - San Antonio, New Braunfels, Seguin
- School Districts:
  - All greater San Antonio area school districts
  - Many private and charter schools
- Bexar County
- Port San Antonio
- Workforce Solutions Alamo
- Aerospace Companies
- Information Technology firms
- Advanced Technology and Manufacturing Companies
  - The San Antonio Manufacturers Association
  - The New Braunfels Manufacturers Association
  - The Seguin Economic Development Council
- Health Care Industry and Local Hospitals
- Heavy Equipment Companies
- Chambers of Commerce
  - The San Antonio Chamber of Commerce
  - San Antonio Hispanic Chamber of Commerce
  - New Braunfels Chamber of Commerce
  - Seguin Area Chamber of Commerce

## TOTAL GRADUATES 2003-2014

Academies Totals (Year of Founding in Parenthesis)	1003
Aerospace (2001)	390
Information Technology & Security (2004)	375
Advanced Technology/Manufacturing (2006)	206
Health Professions (2009)	32
Heavy Equipment Academy (Starting Fall 2014)	TBD

tificate of Completion and industry credentials; receiving work experience through industry paid internships; and helping 95 percent of graduates transition into higher education or well-paid careers in Aerospace, Advanced Manufacturing, IT, Nursing, and now Heavy Equipment.

Over 60 percent of Alamo Academies graduates continue in higher education by moving on to a community college or a four-year institution. Twenty-seven percent of graduates obtain jobs in targeted industry careers with aerospace, advanced technology, manufacturing or IT companies. Other graduates continue their career path by joining the military.

## PLACEMENT: 2003-2014

Targeted Industry Careers	Higher Education	Military	Other/Moved
27%	63%	5%	5%

Recently, the Manufacturing Skills Standards Council recognized the Alamo Academies, citing the success rate and increased availability of skilled workers. The Alamo Academies class of 2014 earned over \$1.73 million in scholarships. Graduates of the Academies receive a starting annual salary of approximately **\$30,500** plus benefits.

The Alamo Academies model is replicable in other communities, states, and countries addressing similar challenges and a lack of a skilled/trained workforce. Other entities could benefit from implementing the Alamo Academies model to create their own skilled workforce pipeline in industries that are vital in their particular community. Community leaders from the Dominican Republic, Colombia, and Brazil visited the Academies to learn how to replicate this outstanding and successful program in their countries.

## LOOKING AHEAD

The Alamo Academies is building on its success with the addition of the new Heavy Equipment Academy which started Fall 2014. The new program provides a college pathway for high school juniors and seniors to attain skills in the heavy equipment industry. The program already has a number of local industry groups supporting and participating in efforts to make it successful. Industry support includes HOLT CAT, ASCO (Case), ROMCO (Volvo), RDO (John Deere), Cooper Equipment, Zachry Construction, Dean Word Co., Martin Marietta, and other heavy equipment dealers and construction businesses.



A 2006 Alamo Academies graduate, Adam Arroyo performs final inspections on a commercial aircraft engine before Test Cell run and delivery to a customer. He earned two associate degrees and his undergraduate degree and is now a contract negotiator for Lockheed Martin.

## PROFILE IN SUCCESS

Alamo Academies graduate Adam Arroyo, 24, is employed at Lockheed Martin Aeronautics in San Antonio. In June 2014, he completed his Bachelor of Arts degree in Business from Texas A&M University-San Antonio and was promoted to contract negotiator with the company. Previously, Arroyo had been the youngest test cell supervisor for Lockheed Martin, testing, troubleshooting, and ensuring that jet engines are airworthy and safe to install in airplanes.

His path here dates to 2006, when Arroyo graduated from San Antonio's Earl Warren High School and at the same time, earned a Level One Certificate of Completion for Aircraft Turbine Mechanic through the Alamo Aerospace Academy and St. Philip's College.

He learned about the Academies program from his brother, also an Alamo Academies graduate. However, for Arroyo, it was the experience of getting to know the Academies program teachers and his co-workers that captured his interest and set him on a career path in aerospace, he said. He recalls how well this dynamic work environment tempered the shock of having to be on the job by 6:45 a.m. for his first paid internship, which was also his first experience in the working world.

School and work proved to be a winning combination for Arroyo. After graduating high school, he was hired to work as an apprentice in the Lockheed Martin apprenticeship program. This U.S. Department of Labor registered apprenticeship is an 18-month program from which he graduated in 2008. In addition to his Certificate of Completion in Apprenticeship for Powerplant Mechanic, he also earned an Associate of Applied Science degree in Aircraft Mechanic Powerplant at St. Philip's College in 2008.

Arroyo is thriving in his job with Lockheed Martin and sees his future in aviation possibly expanding into the area of workforce development or law.

The Heavy Equipment Academy curriculum is extremely detailed and includes an introduction to the basic principles of diesel engines and systems; fundamentals of hydraulics including components and related systems; an overview of computer information systems; an introduction to the basic principles of electrical systems for diesel powered equipment; advanced study of hydraulic systems and components, to name a few. The program will expand in 2015 to include courses in the operation and maintenance of heavy equipment and machinery.

The idea to develop a new academy came into fruition during the San Antonio Chamber of Commerce's Education and Workforce Council meetings in 2013. The idea was presented to the Alamo Colleges trustees, who approved the new program in December 2013. The new program began in Fall 2014 with a full complement of students (capacity is 40 students annually) who will graduate with one year's worth of college credit toward a two-year associate degree. Workers in this industry can earn \$30,000 to \$90,000 a year, accompanied by benefits such as retirement savings plans and college tuition reimbursements.

Numerous industries continue to face worker shortages during this period of economic recovery. The Alamo Academies hopes to address this issue by providing a program that can assist industries that are having difficulty filling positions, particularly as we are experiencing with the Eagle Ford Shale boom. Because of the Eagle Ford, plenty of job openings exist for heavy equipment technicians, both in the field and in shops. San Antonio's Holt Cat alone has about 400 heavy-equipment units rented in the Eagle Ford Shale region at any one time.

The Manufacturing Industry sector in San Antonio is one of the largest in the country. According to the 2011 Texas Manufacturers Register, San Antonio ranked the fourth-largest manufacturing market in Texas, with 51,177 jobs. A 2011 impact study conducted by San

Antonio-based Trinity University indicated that San Antonio's manufacturing industry had an economic impact of \$22.5 billion and paid 11 percent above the average annual salary for all workers in San Antonio.

The addition of the Heavy Equipment Academy brings the Alamo Academies closer to its goal of continually providing skilled workers for booming industry sectors, employing the next generation of science, engineering, and technology workers.

## A MODEL PROGRAM, LESSONS LEARNED

The Alamo Academies model is replicable as evidenced by the replication of additional pathways. While the first program in 2001 focused on Aerospace, the model has added or replicated four additional pathways: IT (2002); Advanced Manufacturing (2004); Health Professions (2009); and Energy [Heavy Equipment Technicians] (2014).

Articulated pathways can be created between public schools and community colleges that connect students to industry demand occupations. Successful models must be sustainable and supported by all aspects of the community (education, industry, and government).

The model can be replicated with adult populations. The "Just in Time" program based on the Academies model is in place at Alamo Colleges to train veterans to complete in-demand industry certifications. The program is also transferable to other communities, states and even internationally. "The city of Seattle is looking to the Alamo Academies program to strengthen their competitiveness in the aerospace industry," Jim Perschbach, Boeing attorney, said and observed that Toyota built a new manufacturing plant in San Antonio in part due to the proven pipeline the Academies model generates. Recently, community leaders from the Dominican Republic and Brazil visited the Academies to learn how to replicate this outstanding program in their countries. 🌐

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