THRIVING IN CHALLENGING TIMES

Connecting Education to Economic Development through Career Pathways

ICW
INSTITUTE FOR A COMPETITIVE WORKFORCE

NCPN
National Career Pathways Network

A joint publication of the
National Career Pathways Network and the
Institute for a Competitive Workforce,
an affiliate of the U.S. Chamber of Commerce

ICW's Mission

The Institute for a Competitive Workforce (ICW) is a non-profit, non-partisan, 501(c)3 affiliate of the U.S. Chamber of Commerce, promoting the rigorous educational standards and effective job training systems needed to preserve the strength of America's greatest economic resource, its workforce.

Through its events, publications, and policy initiatives—and drawing upon the Chamber's extensive network of corporate members—ICW connects the best minds in American business with the most innovative thinkers in American education, helping them work together to ensure the nation's continued prosperity. **www.uschamber.com/icw**

NCPN's Mission

The National Career Pathways Network (NCPN) is an affiliate of the Center for Occupational Research and Development (CORD), a non-profit, 501(c)3 organization dedicated to leading change in education. NCPN members are teachers, administrators, counselors, employers, and community leaders involved in high school and college career preparation programs. They are committed to helping students make smooth transitions from secondary to postsecondary to rewarding careers. They are passionate about improving the educational and economic success of the people in their communities, both traditional students and adults who need and deserve a second chance in public education. **www.ncpn.info**

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Foreword

When I travel the country speaking about Ford Motor Company's education programs, I am often asked why we are "giving away money" to support education, especially in these difficult economic times.

The answer is simple: We are not giving away anything! By supporting education, we are making a critical investment in our future. As a member of the community, we have a vested interest in issues that impact its health and well being. Today, no issue is as important to a community's continued prosperity as education. So investing in education is the right thing to do. But it is also the smart thing to do. As the primary consumer of the nation's education system, the business community needs capable, enterprising employees in order to compete in a global economy. It is hard to imagine what type of technical skills will be needed in five years, let alone 10 years, but here is what we do know — we need employees who:

- are capable of working together across the globe to solve complex problems.
- possess skills capable of managing projects and providing leadership to multi-functional teams.
- are able to anticipate opportunities and/or problems and can do the research and pull together subject matter experts to take advantage of new ideas.
- possess the academic skills, core competencies and enthusiasm necessary to become engineers, scientists, entrepreneurs and compete for STEM (science, technology, engineering and mathematics) careers.
- recognize that business acumen and environmental sustainability is part of every career and job they will compete for in the future.

We must help states and local communities prepare our future leaders. We cannot afford to leave students behind. If we do, we pay the price when they drop out of school and cannot take care of themselves or their families and are not contributing citizens. We pay the price when we spend resources to recruit and hire them, only to find out that they do not have the 21st century skills necessary to succeed in the workplace today. And then we pay the price when we have to send them back to school or to training to acquire these critical workplace skills necessary to succeed.

There are four key areas that businesses must consider when we make an investment in education:

- The first is the development of "human capital." Human capital has become more important than land and buildings, or tax incentive packages. Through a meaningful and educational engagement with students, we are developing a talent pipeline of students who are ready for college and careers. The cost to communities of not taking action — the lack of a skilled workforce — will cause existing businesses to leave and new businesses to stay away.
- The second area is to help educators prepare students with 21st century workplace skills. Businesses of all sizes are looking for employees who possess higher order thinking and leadership skills. Organizations have become lean and need to empower their employees to make decisions using 21st century skills, such as critical thinking, problem-solving, synthesizing data and information from multiple sources, and the ability to be part of a cross-functional team.

- The third area is boomer retirements. The aging of the American workforce and the impending retirement of older workers in key occupations is well-documented. For example, the utility industry projects that 20% to 40% of their workforce will retire within five years, while the pipeline of young workers is insufficient. In coming years, many organizations with a significant number of workers in STEM fields could find themselves with significant worker shortages.
- The fourth area is the increased need for homegrown talent. Communities cannot depend on attraction strategies to strengthen their local workforce. The Millennial generation, today's new employees under age 26, are less likely on average to relocate than preceding generations. That means communities owe it to themselves to better prepare their own students for not just college, but careers close to home as well.

Thankfully, more and more business leaders are coming to understand the direct linkage between workforce and economic development and K-12 education. However, there is still plenty of work to be done. As businesses begin to grapple with looming skill shortages, expect them to become increasingly supportive of high schools in general and specifically career-oriented education programs, such as the career pathway practices contained in this publication. These programs offer direct links to the workplace and can demonstrate results.

With this in mind, the Ford Motor Company Fund developed the Ford Partnership for Advanced Studies (Ford PAS) that provides students with content knowledge and skills necessary for future success. In addition, we provide facilitated support to communities that want to align and organize their support of education that provides the outcomes I outlined earlier.

We believe the solutions to our nation's skills challenges must be developed in partnerships involving both the education and business communities. I commend the partnerships profiled in this publication for their practical and forward-thinking strategies in preparing our nation's youth for their choice of career and their lives.

Cheryl Carrier
Program Director, 21st Century Education Programs, Ford Motor Company Fund
Board Member, Institute for a Competitive Workforce, U.S. Chamber of Commerce

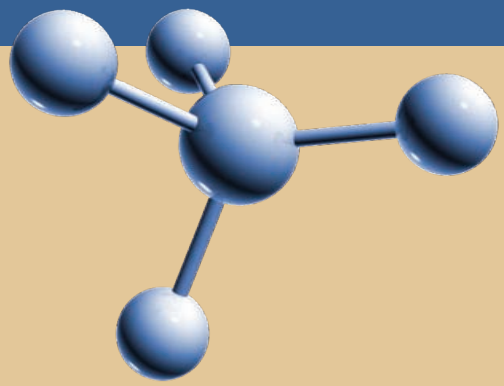
Thriving in Challenging Times

Connecting Education to Economic Development through Career Pathw

Challenging Times Call for Innovative Strategies

It would be an understatement to say that we live in challenging times. Recent events have shaken the foundations of our economic system. Today, as never before, Americans look to our nation's businesses and industries to create innovative strategies for providing jobs and bolstering American competitiveness in the global marketplace.

To fulfill that task, business and industry must have access to an abundant pool of well-qualified workers, which in turn requires that our public school system produce graduates who are ready for the challenges of college and the workplace. Unfortunately, that is not happening. Despite the efforts of countless dedicated teachers and administrators—not to mention billions of dollars spent on education reform—American public education continues to fall short of its potential. Consider the following:



ways

- **High school dropout rates are still high**—roughly 30 percent within the general population, according to some estimates, and considerably higher in urban settings.
- **Many students do poorly in school because they are simply not interested**—For many students, if not most, conventional schoolwork has little to do with what goes on outside the classroom.
- **Too few students find their high school experience academically challenging**—*The Silent Epidemic* (Gates Foundation, March 2006) reported that nearly 47 percent of high school dropouts said a major reason for dropping out was that classes were not interesting.
- **Secondary-to-postsecondary transition rates are too low; postsecondary dropout rates are too high**—Fewer than two out of three American high school students enter postsecondary immediately following graduation, and too few stay in. The U.S. college dropout rate is one of the highest in the industrialized world.
- **Too many college students require remediation**—According to some estimates, of the nation's high school graduates, only about half are prepared for academic work at the postsecondary level.

Along with these trends, demographic changes are making the education enterprise more challenging every day. Our student population is becoming more diverse, introducing a broader range of learning styles and needs. Yesterday's educational system is inadequate to meet today's realities.

Career Pathways: Education with a Purpose

The purpose of this publication is to highlight successful examples of an educational model that creates relevant, challenging learning environments and, if widely implemented, has the potential to significantly increase American employers' access to high-quality, home-grown employees. We call this model *career pathways*.

A career pathway is a coherent sequence of rigorous academic and career courses that begins in high school and leads to an associate degree, a bachelor's degree and beyond, and/or an industry-recognized certificate or license. Career pathways are developed, implemented, and maintained by partnerships involving educators, community leaders, and employers.

As the models featured in this publication demonstrate, career pathway programs can take many forms. At the same time, every career pathway program has three basic components—secondary, postsecondary, and business.

Secondary Component

- Meets rigorous academic standards and grade-level expectations, high school testing and exit requirements, and postsecondary entry/placement requirements
- Provides foundational knowledge and skills in chosen career clusters (*)
- Provides opportunities for dual/concurrent enrollment or articulation of credits

Postsecondary Component

- Provides alignment and articulation with baccalaureate programs
- Provides industry-recognized skills and knowledge
- Provides opportunities for employment at multiple exit points

Business Component

- Provides opportunities for job-shadowing, site visits, internships, and other worksite learning experiences
- Provides curriculum design and feedback
- Provides up-to-date information that enables educators to stay abreast of the real demands of the workplace
- Provides resources ranging from mentoring to funding

A special note to employers—As the preceding table illustrates, business engagement is vital. And by "engagement" we mean more than serving on advisory boards or simply providing funding. While employers *should* be involved in an advisory capacity, a deeper level of commitment is needed. Employers have expertise and resources that enable them to help students connect with the workplace in ways that cannot be replicated in the classroom. As you review the program summaries in this publication, notice the "Business Engagement" boxes. As you will see, while the models differ in many details, they all have committed business partners.

The Power of Career Pathways

Career pathways offer a number of benefits to educators, students, employers, and society in general.

- **Context**—Career pathways show students how academic concepts are used outside the classroom.
- **Purpose**—Career pathways motivate students and give them a desire to stay in school.
- **Focus (with flexibility)**—Every career pathway leads the student toward personal and professional goals—while providing the flexibility to change at any time.
- **Rigor and relevance**—Career pathways are academically rigorous. They integrate STEM subjects (science, technology, engineering, and mathematics) with language arts, social studies, history, and other academic subjects in the context of the world of work.
- **A level playing field**—Career pathways take into consideration the variety of student learning styles.

*Career clusters are occupational categories with industry-validated knowledge and skills statements that define what students need to know and be able to do to realize success in their chosen fields. See also the glossary on page 48.

The reason many employers struggle to find qualified employees is that the high-school-to-college pipeline has become weak. Too many students exit before they have gone far enough to gain the skills necessary to meet the needs of employers.

- **Guidance for career selection and a foundation for career pursuit**—With career pathways, students begin their long-term planning early. As a result, every student has a sense of direction. Every course, every concept leads toward an identified goal.
- **Opportunities for interdisciplinary problem-solving and critical thinking**—Career pathways produce "knowledge workers" who understand systems and can solve problems in teams.
- **A foundation for lifelong learning, and lifelong earning**—Career pathways are all about building toward the future, a future in which students can fulfill their potential on the job and in their homes and communities.

Strengthening the High-School-to-College Pipeline

The education-to-career continuum is a kind of pipeline: As students progress from secondary to postsecondary and beyond, they exercise choice in determining what directions they will take and how far they will go. *The reason many employers struggle to find qualified workers is that the pipeline has become weak.* Too many students exit before they have gone far enough to gain the skills necessary to meet the needs of employers.

We need to make the pipeline stronger, but how? One of the first steps is to identify where we should invest the bulk of our resources. For many students, the answer is community and technical colleges. It is widely believed that the only road to real success in the workplace involves at least a bachelor's degree, but that's not true. While most of today's jobs require education and training beyond high school, only 20 percent require at least four-year college degrees. Consequently, the institutions that are ideally positioned to provide the postsecondary education and training needed for most jobs are the country's almost 1200 community and technical colleges. As you read the program summaries in this publication, you will see that, while career pathways in no way limit how far students should aspire to go in their educational and career pursuits, most career pathways are designed to ensure that by the end of two years of postsecondary education (the associate degree), students are qualified to meet the skill requirements of employers in many fields.

Strengthening the pipeline on a broad scale calls for fundamental changes in our educational system:

1. Encouraging each student to select an *interest area* that gives him or her a purpose for remaining in school.
2. Encouraging each student to formulate a *plan* to prepare for the next step after high school graduation.
3. Providing a *context* within which students learn required, rigorous academics.
4. *Restructuring secondary-to-postsecondary curriculum* in such a way that it supports career pathways; meets state and national academic, skill, and employability (soft skills) standards; and allows students in the eleventh and twelfth grades to take college courses through dual enrollment.
5. Reconfiguring large high schools around student interest areas by offering multiple career pathways.

Accomplishment of these changes is a huge task that can be achieved only with the cooperation, support, and participation of partners from higher education, employers, community leaders, and policymakers.

AchieveTexas: College and Career Initiative

Based on the sixteen federally defined career clusters, AchieveTexas prepares students for secondary and postsecondary opportunities, career preparation and advancement, meaningful work, and active citizenship.

AchieveTexas was developed in 2005 by education professionals and representatives from the Texas Education Agency, postsecondary institutions, regional educational service centers, the Texas Business and Education Coalition, the Higher Education Coordinating Board, and the Texas Workforce Commission. The initiative was developed with the understanding that academic concepts are reinforced and applied through high-quality, rigorous technical education, and that every program of study (POS) should include both academic and technical courses.

AchieveTexas has developed 114 POS models aligned with the sixteen career clusters (at least one for each cluster pathway). All POS use the Recommended High School Graduation Plan (the approved college preparation curriculum) or the Distinguished Achievement Program. Each POS includes a rigorous 4x4 core academic foundation (four English language arts, four mathematics, four science, and four social studies) that is enhanced with career-related courses. The POS help students understand the relationship between education and careers and engage students in their learning so they make informed decisions, graduate from high school, and enroll in and complete college.

Resources include planning guides, a counselor's implementation kit, and a guide highlighting best practices.

AchieveTexas promotes curriculum that incorporates the Texas College and Career Readiness Standards and relevant teaching and learning designed to lead to postsecondary success. For more, visit www.achievetexas.org.

One Size Does Not Fit All

As you read about the programs highlighted in this publication, you will be struck by the *variety* of strategies represented. Collectively, the programs represent a broad range of industry sectors—teaching, biotechnology, healthcare, manufacturing, and aerospace, to name a few. Some programs focus on a single sector while others focus on multiple sectors. For example, one of our multi-sector programs, the College Express program at Danville Area Community College, provides opportunities for high school juniors and seniors to earn dual credit in fifteen career and technical education (CTE) areas. (This publication describes three multi-sector programs. They are grouped together beginning on page 40.)

AREVA NP Inc. / Warren Wright

The programs differ as well in overall structure. Most begin at the high school level, typically involving juniors and seniors but sometimes freshmen and sophomores as well. (The Discover Mechatronics program in Owensboro, Kentucky, sponsors clubs that are open to elementary school students.) Some of the programs would be described as "2+2+2," that is, the last two years of high school coordinated with two years at the community or technical college level and further coordinated with the final two years of bachelor's degree programs. Some of the programs are local or regional while some are statewide. (See the descriptions of the initiatives in Texas and Georgia on this and the following page.) Most are designed to meet specific regional employment needs. For example, a program at Lane Community College in Eugene, Oregon, focuses on the region's high demand for "green technologies." Lane's Summer Youth Career Academy in Weatherization provides 40 hours of instruction and paid time on the job and leads to certification in residential energy analysis. Similarly, the Construction Academy of the Hawai'i Department of Education and Community College System enables high school juniors and seniors to prepare for postsecondary training and careers in the state's construction industry.

The Essential Role of Employers

The full engagement of employers—whatever forms that might take—is essential to the success of career pathways programs. Each program is governed by an advisory committee that includes representatives of the industry that the program is designed to serve. Employers shape the curriculum and provide other benefits—scholarships, fundraising, public relations, internships, job shadowing, mentoring, recruitment, professional development for teachers, equipment donations, and adjudication at student competitions, to name a few.

Career Pathways Results

- More students are graduating from high school.
- Enrollments in "receiving" postsecondary programs are growing, which means that more and more students are succeeding in making the transition from secondary to postsecondary.
- High school students are demonstrating that they are better prepared to make informed career choices.
- Employers are gaining access to a larger pool of qualified workers.
- Students are earning higher scores on standardized academic and career and technical tests.

In addition, partnerships are growing, not only in student enrollments but in the number of organizations—businesses, nonprofits, schools, and others—that are joining the effort.

Career Pathways in Georgia

Georgia has recently initiated two state-level programs that promote career pathways—Georgia Work Ready and the Education Career Partnership.

Georgia Work Ready was launched in August 2006 by Governor Sonny Perdue and the Georgia Chamber of Commerce. Overseen by the Governor's Office of Workforce Development, the initiative is based on skill assessment and certification for job seekers and job profiling for employers. The program has designated six Georgia Work Ready regions, one for each of the state's fastest-growing industries—aerospace, advanced communications, advanced manufacturing, bioscience, energy, and logistics.

Georgia Work Ready is preparing the state's *emerging workforce* (students), *transitioning workforce* (career changers and returning veterans), and *existing workforce* for advancement in the state's regional industries. Each region has assembled an industry network to ensure that its growth plan meets businesses' current and future needs.

A team from each Georgia Work Ready region inventories high school programs and recommended postsecondary coursework. The teams then use this information to develop career pathways that align to entry-level occupations validated by the industry networks.

Partners include the Georgia Department of Education, the Technical College System of Georgia, the University System of Georgia, and more than 150 companies. Funding is provided by the Workforce Investment Act. For more, visit www.gaworkready.org.

The Georgia Department of Education's **Education Career Partnership (ECP)** program, which operates under the auspices of the Career, Technical and Agricultural Education division, supports and promotes postsecondary credit opportunities to ensure that all local systems develop, expand, and promote career pathways and programs of study to facilitate seamless transition from secondary to postsecondary and careers.

Through a coordinated effort that involves business and industry, ECP prepares students for career opportunities by providing coherent, articulated sequences of rigorous academic and career-related courses. Business and industry partners play a vital role in defining standards of performance and assessing the workplace relevance of career pathways and school programs.

Adapting Career Pathways to the Needs of Career-Limited Adults

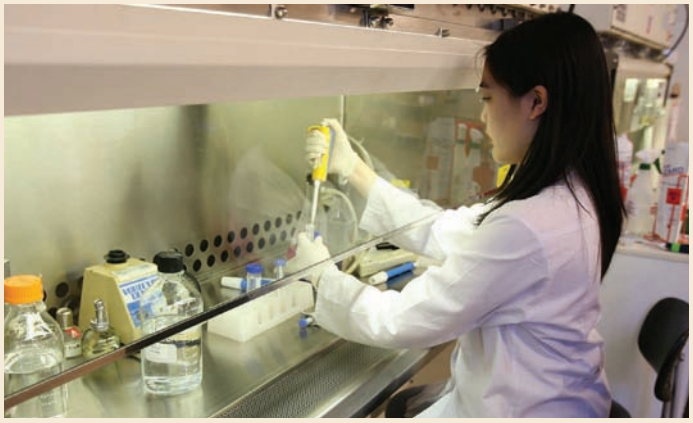
While most of the programs we describe begin in high school, a few are specifically designed to meet the needs of career-limited *adults.* The fact is that millions of unemployed and underemployed Americans have severely limited career opportunities because they lack basic academic and technical skills. From industry's point of view, the problem is not a shortage of people with bachelor's degrees. In many industries, associate degrees or technical certificates are sufficient credentials. But for many adults, returning to school to gain even those credentials presents formidable obstacles.

The good news is that the career pathways concept can be adapted to the unique needs of career-limited adults. This highly flexible model, which we call *adult career pathways* (ACP), offers strategies for overcoming workforce barriers by bringing together industries, community services, government agencies, and community colleges to identify, enroll, and prepare career-limited adults for high-demand career opportunities. ACP programs specifically target the educational needs of demographic groups such as displaced workers, high school dropouts, high school graduates who have little or no college, returning veterans, foreign-born U.S. residents, ex-offenders, and other high-need groups.

Typical ACP program components include the following:

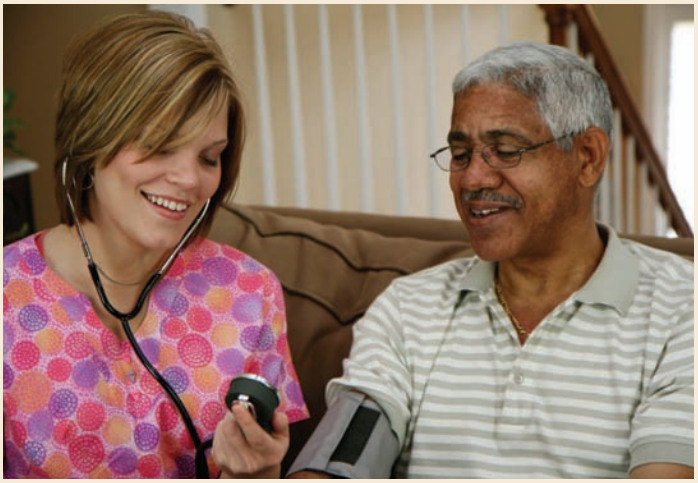
- A "prep stage" designed to prepare participants for job entry and college study
- Industry-focused curriculum
- A multistep career ladder
- Partnerships with community and government agencies
- Part-time employment (usually beginning after completion of the prep stage)
- Personal and academic support services

ACP programs are designed to *expedite transitions*—from unemployment to employment, from underemployment to better employment, or (as in the case of displaced workers) from one industry to another. Among the programs featured in this publication, those at the Bio-Link Center in San Francisco and Blackhawk Community College offer good examples of facilitating such transitions. The Bio-Link program helps students get ready for employment in the region's biotechnology industry by helping them acquire basic math, language, and laboratory skills through a combination of classroom work and worksite internships. The program at Blackhawk helps the area's large number of recently displaced auto workers obtain entry-level credentials in healthcare. Other ACP examples in this publication include the profiles of Indian River State College and Florida Community College at Jacksonville.



The institutions that are ideally positioned to provide the postsecondary education and training needed for most jobs are the country's almost 1200 community and technical colleges. But community and technical colleges cannot do it alone; they must partner with high schools, universities, and employers.

To reap the benefits of adult career pathways, employers in the same fields must be willing to (1) invest in human capital; (2) cooperate rather than compete; (3) adopt a common career ladder; and (4) work with colleges, states, community-based organizations, and other employers. The key elements are *vision* and *leadership*.



The ACP Challenge

Undereducated adults represent a significant challenge to our community colleges, our employers, and our society. Short-term strategies to meet this challenge are ineffective because they only produce short-term results. The situation calls for a new approach.

The ACP concept places a considerable responsibility on employers. For example, the following conditions must be met if ACP programs are to produce the desired results:

(1) Employers must be willing to make the necessary investment in human capital. In some ACP models, this will mean hiring ACP students after they have completed the first stage of a ladder curriculum and continuing to support their educational pursuits through the completion of some industry-recognized credential. This support may take the form of mentoring, paid release time, reimbursement for educational expenses, or other services.

(2) Employers who would normally compete with one another for workers must be willing to cooperate for the sake of workforce development in their communities. Employers who adopt similar career ladders for their ACP employees must agree not to "raid" one another's employees while they are in the ACP program. They must accept the risk that when employees complete their ACP programs, they may "jump ship." Employers must be willing to provide incentives that are sufficient to earn company loyalty.

(3) Employers, in consultation with college administrators and state and regional funding and accreditation groups, must agree on a common curriculum that matches their career ladders. If employers insist that the courses in the more advanced "rungs" be specifically aligned with their companies' needs, the credits earned might not be counted toward associate degrees or be transferable. A college that provides courses that earn only nontransferable credits might not receive full compensation from its state funding agency. These trade-offs must be explored and agreed upon.

(4) There must be unity, flexibility, and cooperation among participating employers, colleges, states, and community-based organizations. Financial and personal aid for most ACP students is usually available somewhere in the community. But accessing, organizing, prioritizing, and accumulating those resources take leadership and vision at the highest levels.

Call to Action

The career pathways concept, whether applied to coordinated secondary-postsecondary programs or to "second chance" programs for adults (ACP), represents a new way of doing business in the educational world. It calls for a new level of involvement on the part of employers and community organizations and a commitment to collaboration between secondary and postsecondary educators.

Career pathways are not a quick fix. They require commitment over the long haul. This publication is, in part, an invitation to employers to join the effort. You stand to benefit greatly, but, more important, you are in a unique position to help others—students, parents, teachers, communities, practically everyone you can think of—by helping to place our nation's workers on a more sure footing that enables them to compete in the global marketplace.

As you read the summaries in the pages that follow, we urge you to consider what role you might play in your community. Refer to the Career Pathways Checklist on p. 46 to help your local partnership develop an action plan.

Advanced Manufacturing Technology and Aerospace Initiative

Snohomish County, Washington

Partners

The Boeing Company and its suppliers; Sno-Isle and Edmonds Tech Prep Consortia; Snohomish, Edmonds, and Lake Washington school districts; Edmonds Community College (EdCC); Everett Community College (EvCC); Center of Excellence for Aerospace and Advanced Materials Manufacturing; Machining Pathways Partnership (MPP); Manufacturing Technology Advisory Group (MTAG)

The Center of Excellence for Aerospace and Advanced Materials Manufacturing (www.the-mpdc.com), a partnership of EdCC and EvCC, serves all of Washington state in the area of advanced manufacturing careers.

MPP consists of Doug Roulstone, founder of MPP and CEO of Damar; Snohomish School District; Snohomish Co. Workforce Development Council; Boeing; IBM; National Tooling and Machining Association; the Sno-Isle Tech Prep Consortium; and EvCC. All these entities have supported the program with funds, services, and/or equipment and software.

> "This program has generated excitement for both students and practicing engineering professionals—it is truly a best in class activity! Our future success depends on attracting high caliber talent which this collaborative program helps us to do."
>
> *–Dr. Alan G. Miller, Director, Technology Requirements, The Boeing Company*

MTAG (www.mtag-wa.org) is a Washington state coalition comprising representatives from industry, labor, education, state government, and community service organizations. MTAG was chartered to develop and promote a manufacturing technology education program that begins in high school and leads to an associate degree.

Target Population and Eligibility

The program serves high school students, typically juniors and seniors in Tech Prep, and community college students of any age. The Tech Prep consortia require students to complete Tech Prep articulated high school classes with an A or B final grade to earn college credit.

Challenges

The need for skilled workers in aerospace and advanced manufacturing is well documented. To meet workforce needs in Snohomish County, high school Tech Prep and community college programs are closely tied with industry. This ensures that students receive education and skills in engineering pathways that also meet Snohomish County employer needs in advanced manufacturing.

Strategies

The Advanced Manufacturing Technology and Aerospace Initiative begins with high school students in Tech Prep, involves the Center of Excellence for Aerospace and Advanced Materials Manufacturing and EdCC and EvCC, and relies on experts in the field to help shape the curriculum through participation on the schools' advisory boards. High school students can take two or more years of training, earning college credits they can apply to advanced manufacturing programs in computer-aided drafting, engineering technology, machining, materials science, pre-engineering, and welding.

Tech Prep prepares high school students for entry-level jobs and builds the foundation for further study and training. Tech Prep programs give high school students a jumpstart on college by offering articulated college programs of study with school districts' pre-engineering programs. Tech Prep streamlines students' transitions from high school to college so they can continue to pursue their education and career goals.

Community college aerospace and advanced manufacturing technology programs offer associate degrees or shorter-term certificates that can be completed in three months to a year by students seeking entry into or career advancement in advanced manufacturing. Aerospace and advanced manufacturing training provides students with the skills they need to be successful in the aerospace, composites, and advanced manufacturing industries. Students have hands-on opportunities to experience the machines and processes they will use in high-tech jobs. Upon program completion, students enter the workforce or transfer to bachelor's degree programs.

Results

Training through the Advanced Manufacturing Technology and Aerospace Initiative has resulted in increases in the number of students who enroll in and graduate from advanced manufacturing programs, the number of skilled applicants who are hired by The Boeing Company and its suppliers, and the number of students who enroll in advanced manufacturing classes in high school. During 2008–2009, the program experienced tremendous growth in the number of participating high schools—growing from one to seven, increasing student participation by approximately 75 percent. The result was that 175 high school students earned a total of 3575 college credits in aerospace and advanced manufacturing pathways. On-time graduation rates are also on the rise.

Business Engagement

Advisory committee members from business and industry help develop the training programs. These include representatives from MPP and MTAG, some of whom are employees of Boeing and its suppliers.

Business personnel contribute by participating in program advisory committees; donating materials and supplies used in the labs; donating funds, equipment, and time on equipment in their own labs; and providing students with career development opportunities, including the ethics competition, mock interviews, and internships.

Funding

Boeing and other industry partners provide equipment, funding, fundraising support, scholarships, guidance, and research on local and national aerospace and advanced manufacturing pathways. Boeing and partner schools invest in staff members' professional development, curriculum development, equipment and software purchase and installation; partner schools invest in facility development. Boeing and industry and school partners have obtained National Science Foundation (NSF) grants, other grant resources, and bonds. NSF grants (www.edcc.edu/grants/nsf.php) to date include Computer Science, Engineering, and Mathematics Scholarships (CSEMS) ($135,000); Enhancement of Materials Technology for Manufacturing – ATE ($1,050,000); Certificates in Advanced Manufacturing (CAM) ($810.000); Proven Practices for Recruiting Women to STEM Careers in ATE Programs ($499,784); and National Resource Center for Materials Technology Education ($1.5 million). The State Board for Community and Technical Colleges provides maintenance funding, funding for Centers of Excellence, and funding for high-demand grants.

Lessons Learned

Align high school curriculum at the onset with community college competencies for dual credit; high school students will form postsecondary relationships from the beginning. Find passionate business leaders who are willing to fund the startup; other businesses and the public sector will follow.

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Automotive Manufacturing

AMTEC (Automotive Manufacturing Technical Education Collaborative)

Kentucky, Ohio, Indiana, Texas, Alabama, Michigan, Tennessee, Mississippi, Virginia

Partners

Community college partners—Kentucky Community and Technical College System, Versailles, Ky.; Bluegrass Community and Technical College, Lexington, Ky.; Jefferson Community and Technical College, Louisville, Ky.; Bowling Green Technical College, Bowling Green, Ky.; Alamo Community College District, San Antonio, Tex.; Tarrant County College, Arlington, Tex.; Henry Ford Community College, Dearborn, Mich.; Lansing Community College, Lansing, Mich.; Macomb Community College, Warren, Mich.; CARCAM Gadsden State Community College, Gadsden, Ala.; Pellissippi State Technical Community College, Knoxville, Tenn.; Chattanooga State Technical Community College, Chattanooga, Tenn.; Ivy Tech Community College, Evansville, Ind.; Vincennes University, Vincennes, Ind.; Itawamba Community College, Tupelo, Miss.; Northeast Mississippi Community College, Booneville, Miss.; Danville Community College, Danville, Va.; Cuyahoga Community College, Cleveland, Ohio; Owens Community College, Toledo, Ohio

Industry partners—Avanzar Interior Technologies, San Antonio, Tex.; BMW, Spartanburg, S.C.; Capital Area Manufacturing Council (CAMC), Lansing, Mich.; Denso, Knoxville, Tenn.; Ford Cleveland Engine, Cleveland, Ohio; Ford Kentucky Truck Plant, Louisville, Ky.; Ford Motor Company, Dearborn, Mich.; General Motors Corporation, Warren, Mich.; General Motors Technical Center, Warren, Mich.; GM Delta Township Plant & Grand River Assembly, Lansing, Mich.; GM-Arlington, Tex.; GM-Bowling Green, Ky.; Goodyear Tire & Rubber, Danville, Va.; Honda Manufacturing of Alabama, Lincoln Ala.; Hyundai Motor Manufacturing, Alabama, Montgomery, Ala.; International Diesel of Alabama, Huntsville, Ala.; Lincoln Electric Co., Cleveland, Ohio; Mercedes-Benz U.S. International, Vance, Ala.; PBR/Bosch Knoxville, Knoxville, Tenn.; Pontiac Assembly Center, Pontiac; Rieter Automotive North America, Inc., Oregon, Ohio; Toyota Motor Engineering and Manufacturing North America, Georgetown, Ky.; Toyota Motor Manufacturing Alabama, Huntsville, Ala.; Toyota Motor Manufacturing Kentucky, Georgetown, Ky.; Toyota Motor Manufacturing Mississippi, Tupelo, Miss.; Toyota Motor Manufacturing Texas, San Antonio, Tex.; Toyota Motor Manufacturing, Princeton, Ind.; Volkswagen, Chattanooga, Tenn.; Webasto Roof Systems, Inc., Lexington, Ky.; Woodbridge Lansing, Lansing, Mich.

Target Population and Eligibility

AMTEC is a community college program. Each AMTEC college follows its own admission requirements. In most cases, students must have high school diplomas or GEDs. Participants include recent high school graduates as well as incumbent or displaced workers who seek enhanced skills.

Challenges

AMTEC challenges community colleges and the automotive manufacturing industry to work together in producing highly skilled technicians and manufacturing engineers. AMTEC recognizes the need for specially trained employees who can adapt to increasingly flexible and lean manufacturing lines, fluctuating customer demand, a growing focus on green manufacturing, and increasingly complex technology.

Strategies

Through the AMTEC initiative (1) auto manufacturing-required workforce competencies are validated and kept current; (2) competency measurement tools and processes are identified and standardized for common and specialty skills; (3) individuals acquire the competencies they need to perform their jobs; (4) participating colleges continuously adapt to changes in auto manufacturing; (5) workforce utilization is maximized by project partners by documenting industry and experiential learning and fully utilizing the workforce development system to ensure access to job openings; and (6) more individuals are pursuing career pathways in auto manufacturing. This is made possible

Funding

AMTEC is supported entirely by a $5.5 million grant from the National Science Foundation's Advanced Technological Education program.

by AMTEC's modularized curriculum, the availability of multiple entry and exit points, program delivery flexibility, and a shortened learning cycle.

Results

Participation in AMTEC has increased collaboration on a broad scale—between industries, between colleges, and between colleges and industries. Results include a new and revised training curriculum that, according to industry partners, has increased efficiency in their workforce development. AMTEC serves as a unique clearinghouse of information and resource sharing on the latest trends in technology and training. In addition, AMTEC provides a national platform for dialogue and networking within and among colleges and industry stakeholders. The impact has been improved relations with workers' unions, increased credibility of the partner community colleges, and increased coordination between industry competitors. According to the latest survey of results, 50 percent of the industry participants and 85 percent of the college participants in AMTEC activities have revised or added new courses to their education and training programs; 88 percent of the industry participants reported that participation in AMTEC has led to greater ties with the community colleges; 62 percent of the industry participants reported increased discussions with upper-level management regarding training opportunities; and 58 percent of college participants reported more involvement with the auto industry on workforce development issues.

Lessons Learned

One of AMTEC's original goals was to create a standardized curriculum. It soon became evident that creating one stand-alone national curriculum would not work. DACUM/Delphi's were administered to identify knowledge and tasks needed in automotive manufacturing. Regional workshops were held to identify gaps in the curriculum. In addition, it was discovered that validated assessments were needed to identify gaps in skills and knowledge. Open dialogue and collaboration have resulted in creative solutions.

Business Engagement

AMTEC is led by an executive committee consisting of representatives from the Kentucky Community and Technical College System, Alamo Community College District, Pellissippi State Community College, Henry Ford Community College, Macomb Community College, Ford, General Motors, PBR/Bosch, and Toyota. Academies, workshops, and other activities are hosted by partners at their sites. Participants in these events experience the distinctive characteristics of each hosting entity and practice productivity-enhancing techniques such as *genchi genbutsu* ("go and see for yourself," a site-based approach to problem-solving). Industry partners also contribute to planning, assessment, and curriculum development.

AMTEC
Automotive Manufacturing Technical Education Collaborative

KCTCS
HIGHER EDUCATION BEGINS HERE

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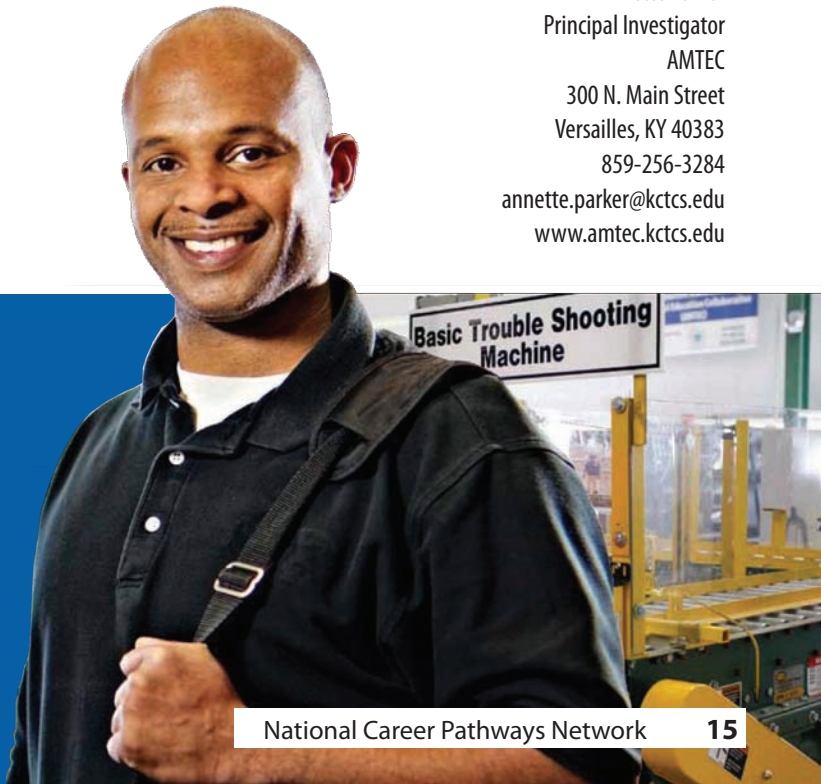

"In these challenging economic times, the U.S. automotive industry must remain competitive on a global basis. . . . The relationships and the learning shared by the AMTEC partners are encouraging and rewarding. It is remarkable that the UAW, GM, Ford, Toyota, BMW, and others can sit in a room and work together openly and cooperatively with our college partners in the interest of developing the best technical workforce in the world."

–Joanne Pritchard, Global Maintenance Manager, General Motors

Bio-Link's "Bridge to Biotech"

San Francisco, California

Partners

City College of San Francisco (CCSF), BayBio Institute, Bay Area Biotechnology Education Consortium (BABEC)

Target Population and Eligibility

The Bridge to Biotech program was developed principally for working adults who return to school to prepare for careers in biotechnology. The program serves approximately 40 students per semester.

Challenges

Returning adult students often lack the basic academic skills necessary for success in college-level study. In many cases, math presents a special challenge, since returning students are often weak in this discipline.

Strategies

CCSF and its partners promote access and opportunities in biotechnology careers. The Bio-Link National Science Foundation Advanced Technological Education (ATE) Center for Biotechnology was established at CCSF in 1998. Many efforts have been made to establish the skills-based programs necessary to produce skilled workers for biotechnology industries in the San Francisco Bay Area. One of the keys to the success of CCSF's biotechnology program has been Bridge to Biotech.

Bridge to Biotech is a two-semester lab assistant certificate program (14 units plus a 180-hour internship). Bridge students learn essential laboratory techniques while strengthening the math and language skills needed for more advanced biotechnology courses. Bridge students are taught how to highlight their work-related skills so that they can promote themselves with confidence when seeking employment. In the first semester, students take Research Skills for Career Opportunities in the Biosciences (2 units), Language Skills for Technicians (3 units), Practical Mathematics (3 units), and Biotechnology Laboratory Techniques (2 units). During the second semester, students take GLP and GMP Principles (1 unit), GMP Compliance (1 unit), and Biotechnology Internship Experience (2 units). In the second semester, students also practice newly acquired skills through internships at local research labs or biotech companies. All coursework is credit-bearing and counts toward CCSF's biotechnology certificate or AS degree.

In addition to providing online resources and faculty development workshops, Bio-Link operates an equipment depot for the distribution of industry-donated equipment and supplies to teachers, community college faculty, and university instructors. Launched in 2002 with funding provided by Genentech, the depot accepts high-caliber equipment and supplies from companies and makes them available to over 200 teachers and 85,000 students in northern California. The depot's staff includes over 40 regular volunteers.

Funding

Bio-Link is funded through the National Science Foundation's ATE program.

Results

The Bridge has improved recruitment and retention for CCSF's biotechnology program. The Bridge's retention rate is 85 percent, and the retention rate for students who enter the CCSF biotechnology program from the Bridge is 90 percent. The Bridge strategy has increased enrollment in the biotechnology program from 50 in 2001 to a current enrollment of over 600 students a semester. In addition, communities where the Bridge students reside now recognize that biotechnology career pathways are open to young people. Word has spread into high schools, middle schools, community organizations, and churches. Successfully employed professionals from the Bridge mentor incoming Bridge students, and companies are providing internship opportunities to acquaint students with real working experiences.

> "The 'Bridge to Biotech' provides a pivotal opening for people seeking careers in biotech, and is unique in creating access for individuals just beginning or returning to college-level study, often from socioeconomic backgrounds underrepresented in the industry."
>
> *–Lori Lindburg, BayBio Institute*

Successful Bridge completers with courses in chemistry and biology have a variety of educational options at CCSF. In addition to the AS degree, students can complete certificate programs in biotechnology, biomanufacturing, genomics technology, stem cell technology, bioprocess instrumentation and control, and (in the planning stage) environmental monitoring and biomedical equipment technician. With the resulting skill sets in place, program completers are employable and are qualified to enroll in four-year programs. Companies frequently offer educational reimbursement for further related education.

Lessons Learned

Most adults who return to school must balance a broad range of often competing responsibilities—work, family, and education, among others. Consequently, as students, they must focus their attention on knowledge and skills that are directly applicable to the workplace. To be effective, adult career pathways programs must enable those returning adults to understand how their studies are relevant to their career goals. One of the keys to the success of the Bridge to Biotech program is that its coursework emphasizes the practical importance of basic math and language skills. Students acquire useful information about how math skills are necessary to interpret raw data and understand experimental lab findings, and how language skills are necessary to communicate effectively and demonstrate competencies to colleagues and prospective employers.

Business Engagement

During the internship phase, the program receives direct input from industry professionals who help to shape the curriculum. Each internship experience involves site visits during which student interns, program staff, and internship supervisors have the opportunity to give and receive feedback about the program. Laboratory supervisors who want to gain teaching experience are given opportunities to teach Bridge internship classes. By framing the supervision of interns as an opportunity to teach, the Bridge program has increased the buy-in of industry professionals.

Bio-Link relies heavily on its partnership with BABEC (Bay Area Biotechnology Education Consortium) for networking with teachers. BABEC promotes workforce education at community colleges and is actively involved in networking and disseminating career information. The BayBio Institute has provided many valuable industry connections. Through these connections, Bio-Link has received equipment donations from numerous companies. Many biotechnology companies support Bio-Link and community college programs, including those at CCSF.

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Construction Academy

State of Hawai`i

Partners

University of Hawai`i Community College System (Kaua`i Community College, Hawai`i Community College, Honolulu Community College, Maui Community College), Hawai`i Department of Education (34 high schools statewide), The Pacific Resource Partnership, Building Industry Association – Hawai`i, Actus Lend Lease

Target Population and Eligibility Requirements

The Construction Academy is a partnership between the Hawai`i Department of Education and the state's community college system. It is a pre-apprenticeship program that targets high school juniors and seniors in specific courses. High school students enrolled in Building and Construction, Electricity, and Drafting Technology are considered Construction Academy participants.

Challenges

In 2006 Hawai`i was experiencing an estimated $10,000,000,000 boom in new construction that created a critical shortage of qualified workers in the trades. Projections indicate that, over the next several years, Hawai`i will need between 10,000 and 26,000 more construction workers to meet industry demand. Officials at organizations representing the construction trades note that the United States Bureau of Labor Statistics estimates that the industry will need to add 100,000 jobs each year through 2012, while also filling an additional 90,000 openings vacated largely by retiring baby boomers.

Strategies

To meet the critical labor shortfall, Hawai`i implemented a multi-pronged strategy. The first part of the strategy was to develop awareness and interest in the construction industry while providing a foundational education for students. This awareness is being established through a pre-apprenticeship program called the Construction Academy. The second part of the strategy involves ensuring that a larger base of candidates can enter postsecondary professional construction training programs. This portion of the strategy is being accomplished through expansion of the state's apprenticeship training programs.

The Construction Academy's mission is to help high school students gain the technical, academic, and employability skills necessary to pursue careers in the construction industry. To fulfill that mission, the community college system, in partnership with the Hawai`i Department of Education, contracted with CORD, a nonprofit organization, to develop an integrated curriculum that addresses the student learner outcomes for specific community college courses. Community college faculty members and department of education teachers jointly

Funding

The Construction Academy began in 2004 with a $1.4 million grant from the U.S. Department of Labor. This grant started a pilot program whereby the University of Hawai`i's Honolulu Community College (HCC) partnered with eight high schools on O`ahu—Kahuku, Kailua, McKinley, Mililani, Pearl City, Radford, Waipahu, and Waialua—to help high school students acquire the technical, academic, and employability skills relevant to careers in the construction industry. The initial results of this federally funded academy model showed such great potential that in late 2005 many associated with education and construction felt that it warranted expansion.

In 2006, the Hawai`i State Legislature passed Senate Bill 2980 SD2, HD1, CD1, which appropriated $5.4 million to expand the Construction Academy to other public high schools on O`ahu as well as on the islands of Kaua`i, Maui, and Hawai`i, and to increase apprenticeship training at Honolulu, Hawai`i, Kaua`i, and Maui Community Colleges.

> I would recommend this course to all high school kids who want to get into the construction field or are thinking about this field. My experience in this class was fun and interesting. It got me into welding and now I'm going to school to be a welder."
>
> *–Construction Academy student*

deliver this hands-on applied curriculum in safe learning environments.

The community colleges develop relationships with the high schools in their service areas. To allow for portability of the community college credits earned through this program, community college campuses have established a horizontal articulation agreement that allows students to apply earned credits throughout the state system.

Results

Between the 2007 and 2009 academic years, high school participation grew from 27 to 33 high schools statewide. Student participation increased from 975 to 2220 in three years. Honolulu Community College conducted a follow-up survey of high school senior participants who graduated in June 2007. Students were asked to provide contact information at the end of the school year and were then called by their Construction Academy instructors in October 2007. A total of 122 seniors provided contact information. Of these students, instructors were able to contact 82 (62 percent) of the 2007 graduates who had participated in the Construction Academy program on O`ahu. Of the students contacted, 30 (36 percent) reported that they were involved in construction-related activities through apprenticeships, education, or direct employment. The Construction Academy is continuing to gather information from graduates to assist in its program improvement efforts.

Business Engagement

The Pacific Resource Partnership (PRP) is a joint program of Hawai`i's unionized building contractors and the Hawai`i Carpenters' Union. PRP has been instrumental in supporting legislation and funding for the Construction Academy and provides educational opportunities for teachers through a summer internship program. Academic and CTE teachers spend two weeks during the summer visiting construction job sites and are exposed to all aspects of the construction industry from planning to completion. PRP also provides direct support to the Construction Academy by providing guest speakers and monetary and advisory support.

Actus Lend Lease has a large presence in Hawai`i's construction industry, particularly in the construction of military housing. Actus Lend Lease has developed an after-school mentoring program at two Construction Academy schools. It provides field trip opportunities for students and has always been willing to contribute to the Academy program by providing human resources and expertise in the classroom.

Lessons Learned

Building bridges between large educational institutions such as the Hawai`i Department of Education and the University of Hawai`i Community College System can be challenging. Communication between all parties involved is essential to successful implementation of any program of this magnitude.

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CONSTRUCTION ACADEMY
HONOLULU COMMUNITY COLLEGE

Education and Training

Academy of Teaching

Anne Arundel County, Maryland

Partners

Anne Arundel Community College (AACC), Anne Arundel County Public Schools (AACPS), Anne Arundel Community College University Consortium (College of Notre Dame of Maryland, McDaniel College), Anne Arundel County Tech Prep Local Labor Market Team

Target Population and Eligibility

The Academy of Teaching is part of the Anne Arundel Academies, Inc., a 501(c)3 organization. Participating high school students are generally in the tenth or eleventh grade. The program is offered at nine of the county's twelve comprehensive high schools. At the postsecondary level, students age 18 to 60+ (mostly 20–24) select one of seven associate of arts in teaching (AAT) majors. Roughly half attend full-time.

Challenges

As the fifth largest school system in Maryland and the 41st largest school system in the nation, AACPS serves a diverse population of students that spans urban, suburban, and rural portions of the county. Over 75,000 K–12 students are enrolled in 116 public school facilities that include twelve high schools and two centers of applied technology.

Strategies

To help alleviate teacher shortages, AACPS committed to a "grow your own" strategy and developed the Academy of Teaching in collaboration with AACC. The Academy of Teaching is an "academic completer" program. High school coursework is aligned and sequenced with AACC's teacher education program. A bridge math course was created to help reduce the need for developmental math.

The Academy of Teaching grew out of the College and Career Transitions Initiative (CCTI) project. To facilitate high school transition, the project developed an instructional and student services work team representing both secondary and postsecondary faculty and staff. The Academy of Teaching was created to allow students to move seamlessly into any of seven AAT programs at the community college—early childhood, elementary/general special education, chemistry, English, math, physics, and Spanish. About 50 percent of completers of the secondary program enroll in AAT programs at the college. Through Jump Start, a concurrent college enrollment program, high school students 16 and older are able to take college courses at a 50 percent tuition reduction. For students who seek baccalaureate degrees, the AATs are fully transferable into any Maryland public or private college or university.

The Academy of Teaching includes a strong work-based learning (WBL) component. All students complete three fifteen-hour fieldwork experiences. For example, one group of Academy of Teaching students, under the direction and supervision of their teacher, recently planned, prepared, and taught physics lessons to fifth graders. Such fieldwork experiences include assignments with guided activities that relate the experiences back to students' coursework and tie

Funding

The League for Innovation in the Community College's College and Career Transition Initiative provided the initial funds to support a part-time transfer advisor, full-time advisor for the teacher education, and part-time Transition Advisor. Grant funds also supported a full-time program coordinator. Two years into the project, the full-time advisor for teacher education and the program coordinator were added to the college's operating budget, with the Transition Advisor position funded through the local school system.

Business Engagement

Anne Arundel County Public Schools serves as both the secondary partner and the primary employer of teachers. AACC has a long-standing history of providing professional development for incumbent teachers and designed a cohort program to meet the needs for "highly qualified" paraprofessionals. Business and industry partners, along with AACC staff and faculty, also participate in fundraising activities that support program enhancement opportunities and scholarships.

into professional teaching standards. Academy students also have the option of taking a course titled "Professional Career Internship."

A variety of strategies designed to support successful student transitions between institutions have been implemented. College staff administer Accuplacer to assess college readiness. A dedicated full-time advisement coordinator is available at AACC. A part-time Transition Advisor, who reaches over 1200 students annually through classroom presentations and special events, is the primary link among the participating high schools and AACC. Recently, a panel of AACC education students began visiting Academy of Teaching classrooms to share information on college preparation, strategies for successful transitions, and college expectations. Information sessions familiarize parents with college expectations, early assessment, financial aid, concurrent enrollment opportunities, and a host of college-related support services. The TEACH Institute hosts an annual open house for area colleges and universities for AACC teacher education students transitioning to baccalaureate-granting institutions. Through the AACC University Consortium, students are able to pursue baccalaureate and graduate degrees in education through a part-time accelerated cohort model.

> "The TEACH Institute at AACC is incredibly welcoming and informative. The things that I have learned through the classes taken and the students and professors I have met will always be with me.
>
> *–Student participant*

Results

The Academy of Teaching has been expanded into nine of the twelve county high schools with an average of 40 participants per school. The number of AAT degrees has expanded from one to seven and the number of certificates from zero to eight. Enrollments have increased significantly and the graduation rate for AAT students has doubled over the past five years. The number of graduates of the AAT programs has increased 230 percent since 2003.

Lessons Learned

Support from college and county school leadership, along with communication strategies that reach all constituency groups, is essential in partnerships and collaboration. Large educational systems are complicated and at times difficult to negotiate. Identifying a "point person" helps keep the work on target. Having strong internal and external "champions" helps to facilitate the process. Career pathways are a powerful advising tool. Creating and implementing strategies that disseminate them is important.

ANNE ARUNDEL COMMUNITY COLLEGE UNIVERSITY CONSORTIUM

ANNE ARUNDEL COUNTY PUBLIC SCHOOLS

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Anne Arundel Community College

A.J. Moore Academy of Finance

Waco, Texas

Partners

Business partners: Educators Credit Union; Brazos Higher Education Authority; Insurors of Texas; Extraco Banks N.A.; Chase Bank; Jaynes, Reitmeier, Boyd & Therrell; NeighborWorks; the Baylor University School of Business; and the Greater Waco Chamber of Commerce

Education partners: McLennan Community College, Texas State Technical College, and Baylor University. Other expertise is provided by the state's Region XII Education Service Center and the Center for Occupational Research and Development (CORD).

Target Population and Eligibility

A.J. Moore Academy's 700 students (9–12) reflect the diversity of the community: 34 percent African-American, 50 percent Hispanic, and 16 percent white. Approximately 22 percent have disabilities and 84 percent are economically disadvantaged.

A.J. Moore is the magnet high school for the Waco Independent School District (WISD). The only requirements for application are the expressed interest in one of six career academies. Students follow four-year career pathways in the Academy of Finance or any of five other pathways: Engineering, Environmental Technology, Health Professions, Hospitality and Tourism, and Information Technology.

Challenges

In 1996, WISD committed to the development of a magnet high school that prepares urban, at-risk students to pursue careers in technology, engineering, and business/entrepreneurship. The career academy model was chosen because its features are beneficial to economically disadvantaged students—educational experiences that integrate academic principles and work skills; real-world educational opportunities; service learning; real-world relevance through the integration of language arts, science, math, and social studies in the context of careers; and the involvement of businesses and community organizations.

Strategies

The school strives to present a rigorous, career-focused curriculum that meets state standards and helps students apply skills and knowledge to the real world.

Career and technology teachers receive adjunct teaching status at McLennan Community College and/or Texas State Technical College. This gives students the opportunity to receive dual credit for their academy courses. To receive dual credit, students must maintain an 80 or better in class and receive an 80 or better on the college final exam. Advanced Placement courses are also available.

Each day core academic teachers meet with their peers to develop project-based learning activities and determine the best courses of study for specific students. WISD acquires and analyzes state test results and test questions to identify areas in need of improvement in curriculum and instruction.

All academy students participate in internships. These paid employment experiences bring relevance to learning and strengthen student transitions into employment and further education. Several students have started their own businesses while still in school.

Juniors in the Academy of Finance (AOF) have taken, or are enrolled in, the following courses: Business Computer

Business Engagement

The A.J. Moore Business Advisory Board is made up of more than 60 business, education, and community leaders. The board meets on a monthly basis. Each member serves on one of five committees: recruitment/student life, industry education/curriculum, internship/mentoring, public relations, and fundraising and scholarships. Through these committees, members review curricula to ensure that appropriate knowledge and skills are being taught, provide job shadowing opportunities and paid summer internships, donate equipment and services, conduct fundraising activities, recruit new advisory board members, conduct mock job interviews, and review applications and conduct interviews for scholarship applicants.

Information Systems 1, Recordkeeping (Principles of Finance), Business Support Systems, Accounting I (Financial Accounting), Accounting II (Managerial Accounting), Banking and Financial Systems, Business Ownership, Business Management, and the Internal Revenue Service's Volunteer Income Tax Assistance (VITA) certification.

AOF students volunteer to do free after-school income tax preparation. Since the school's VITA program began in 2005, AOF students have completed over 5900 returns representing almost $7,800,000 in refunds. In addition, it is estimated that the VITA program has saved Wacoans almost $900,000 in tax preparation fees. Because of excellent training and quality review, the program's electronic filing reject rate has remained below 6.2 percent. The IRS has designated A.J. Moore as one of the top ten VITA sites in Texas.

Results

During 2007–2008, A.J. Moore became one of only 79 schools in Texas to receive the ACT College Readiness Award for raising ACT scores while increasing the numbers of students taking the ACT. The graduation rate is more than 98 percent and the attendance rate is 95 percent. Last year, over 32 percent received advanced credit for college.

A.J. Moore's Academy of Finance is affiliated with the National Academy Foundation, as are three of the school's other academies (Information Technology, Engineering, and Hospitality and Tourism). The International Center for Leadership in Education selected A.J. Moore as one of thirty model schools in the country.

At the time of their high school graduation, most A.J. Moore students have as many as 18 college credits. Ninety percent of A. J. Moore graduates declare their intention to enroll in postsecondary education.

A.J. Moore students continue to increase their academic performance on state testing, and each year the number of graduates who attend college increases. The class of 2009 received over $1.8 million dollars in scholarships. Seventy-eight percent graduate on advanced academic measures.

Lessons Learned

Students initially took academic classes in academy cohorts. This proved to be problematic and was discontinued, but the principle that cohort grouping was intended to promote—the teaching of academic concepts in the context of their application—is supported through project-based learning.

Funding

Funds for personnel, equipment, and materials are generated through state and federal career and technology education monies. Each of A.J. Moore's career academies began in the ninth grade and grew into a four-year program. This allowed costs to be spread over time. Several grants, including the Texas Science, Technology, Engineering, and Math (T-STEM) Academy Grants, Phases 1 and 2, have helped to defray the cost of professional development, equipment, and development of a summer program for incoming ninth graders. Campus funds are allocated for student study trips and transportation to job shadowing sites. Scholarships are raised through events such as volleyball and golf tournaments.

Educators Credit Union

A J Moore Academy

GREATER WACO CHAMBER™

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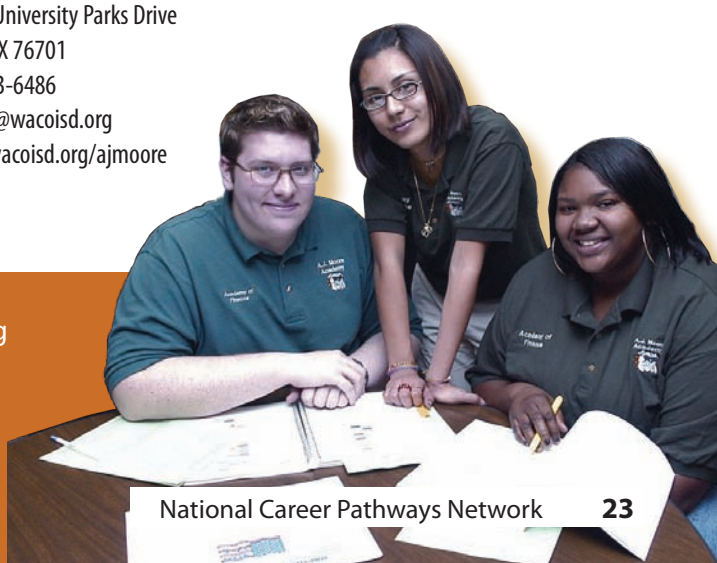

"For three years, Educators Credit Union has provided job shadowing and internship experiences for Academy of Finance students. They are well taught, well prepared, well behaved, and eager, enthusiastic young ladies and gentlemen."

–Jim Smith, Educators Credit Union

Graphic Communications

Graphic Communications Academic Challenge Program

Southern California

Partners

California Polytechnic State University, San Luis Obispo; Los Angeles County Department of Education; Fullerton College; North Orange County Community College District/Center for Applied Competitive Technologies and Multimedia & Entertainment Initiative; Design 2 Print, an Industry-Driven Regional Collaborative Grant funded by the California Community Colleges Chancellor's Office—Economic and Workforce Development ProgramCastle Press; Grafico, Inc.; PrintFest; California Graphic Arts Educators Association; Graphic Arts Club of Los Angeles; Micro Perfect Systems; and PROTRADE, Inc.

Target Population and Eligibility

Students who enter the competition come from 50 participating high schools in Los Angeles, Orange, Riverside, San Bernardino, Ventura, and San Diego Counties and are enrolled in classes related to the graphic communications industry.

Challenges

Many changes, both rapid and gradual, have been occurring in the graphic communications industry over the past two decades, creating a need for workers with a broad knowledge of industry production processes and systems—from conventional to cutting-edge.

Strategies

PIASC/RAISE Foundation's Academic Challenge Program and Student Assembly is a two-phase competition that introduces high school students to the full spectrum of graphic communications, a field that encompasses concept, design, production, fulfillment, and mailing services. The program provides a hands-on approach to both the academic and technical aspects of the industry. Its purpose is to publicize and promote career opportunities in the graphic communications field and to promote the graphic communications programs available through local high schools, community colleges, and universities.

The program has three levels—two in the first phase (Academic Challenge Program) and one in the second phase (Student Assembly).

Level 1: Academic Challenge Program—Technical Project (September–February) and Technology Application Test. The first level gives students an opportunity to develop team-building skills and to apply their technical knowledge to the planning, development, and completion of their schools' assigned projects. A panel of industry experts reviews the entries and selects the top eight projects. Each of the eight winning schools selects a three-person team that proceeds to Level 2.

Level 2: Academic Challenge Program—Written Examination (March–April). The second level gives the top

Business Engagement

The program's founder and principal fundraiser is PIASC/RAISE Foundation, a nonprofit organization supported by contributions from its industry members. The program also benefits from the support of southern California's many printing businesses and educational programs. For example, California Polytechnic State University, San Luis Obispo supports the program through its exceptional four-year program in graphic communications. The Los Angeles County Department of Education provides program support, as does Fullerton College, which has co-hosted the competition and provided theater and campus facilities.

Funding

While funding comes primarily from PIASC/RAISE Foundation, some businesses contribute directly to the program, for example, North Orange County Community College District/Center for Applied Competitive Technologies (CACT), Multimedia & Entertainment Initiative; and Design 2 Print (California Community Colleges Chancellor's Office), both of which provided funding for the 2009 assembly. Others provide funding for competition prizes and special recognition awards, student transportation, event space rental, and meals for student competitors.

eight teams an opportunity to demonstrate in writing their knowledge of the graphic communications industry. Students take a written exam that covers both academic and technical aspects of the industry. The exam is based on respected industry resources such as the Graphic Arts Technical Foundation (GATF) and International Paper's *Pocket Pal* (a standard reference tool). The exam covers topics such as history, industry terms, paper elements, typography and design, prepress/press, binding and finishing, and variable data. Each of the top five scoring teams is invited to send a representative to Level 3—the final competition.

Level 3: Student Assembly—Game Show Competition (May). The five selected students (one from each team) apply industry knowledge, timing, and strategic use of earned points in a format similar to that of the TV program *Jeopardy*. The competition takes place before an audience of high school students, teachers, parents, and industry representatives. All five students win scholarships and trophies. The first place winner also receives a complete Macintosh computer system for his or her school. The runners-up receive supply and equipment funds for their schools' educational programs. The winning team is publicly recognized by local government and community leaders.

Results

Like most industries, the graphic communications industry is experiencing technological advances that are increasing the demand for a well-trained and highly skilled workforce. Global and regional competitiveness, the implementation of "green" processes, the aging of the current workforce, and the use of new materials require a new workforce that has an up-to-date knowledge of the industry. If it is to "grow" a skilled workforce and keep the pipeline from high school to college to industry open, the American public education system must have high-quality hands-on career and technical programs at the middle and high school levels. By providing valuable career-related experiences for many young people, this program is helping to meet that need.

CACT
Centers for Applied Competitive Technologies
MAKING IT IN CALIFORNIA

Lessons Learned

Partnerships are paramount in the development and implementation of successful career exploration programs. In providing career exploration experiences for thousands of Southern California high school students in the last 20 years, this program has proven that lesson many times over.

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NORTH ORANGE COUNTY COMMUNITY COLLEGE DISTRICT
Greatness. *Achieved.*

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PIASC RAISE FOUNDATION

Green Technologies

Summer Youth Academy in Weatherization

Eugene, Oregon

Partners

Lane Community College and its Northwest Energy Education Institute (NEEI), Bonneville Power Administration, Eugene Water and Electric Board (EWEB), Emerald People's Utility District, Lane County's Housing and Community Services Agency (HACSA) and its private contractors (e.g., Emerald Valley Weatherization, Marshall's, Home Comfort, and Premium Efficiency), affiliates of the Lane Workforce Partnership, and other environmentally proactive businesses and organizations in the American Northwest

Target Population and Eligibility

The Lane Summer Youth Career Academy in Weatherization was initiated to provide residential weatherization installer training to 20–25 at-risk youth between the ages of 16 and 24. All of the participants meet Workforce Investment Act at-risk eligibility criteria, which include documented barriers to success. An additional requirement is a strong interest in the subject matter, which most Lane County residents possess.

Challenges

The need for energy workers is rapidly growing. Lane County's Housing and Community Services Agency (HACSA) and its private contractors anticipate increased need for weatherization installers as more federal dollars become available for energy projects to improve energy efficiency in low-income residences.

Lane County's unemployment rate is 14.2 percent (June 2009). To meet the challenge of putting more people back to work, Lane Workforce Partnership has contracted with Lane Community College to expand its green job career pathway programs for adult low-income and dislocated workers by granting funds to increase capacity in the college's degree programs. With NEEI's experience and community connections, Lane Community College will be an integral part of further development in the green economy.

The American Solar Energy Society identifies more than 9 million jobs tied to renewable energy and energy efficiency and forecasts 37 million such jobs in the United States by 2030. Because of a well established infrastructure, Lane County and the state of Oregon are recognized as places where green jobs are likely to expand.

Strategies

Lane Community College has been a leader in environmental stewardship and green workforce training since the early 1980s, when it established an associate degree in energy management. Within the last few years, degree programs have been added in renewable energy, water conservation, and resource conservation management. In 1998, Lane added the NEEI, which, along with its partners, provides continuing education in energy and building-related education across the United States. Certificates can be earned in energy management, building operation, the Bonneville Power Administration Residential Auditor Program, and the National Sustainable Building Advisor Program.

> "We are seeing a huge increase in interest in energy programs among students. Our associate degree program has tripled over the last three years and virtually all of the graduates have found jobs."
>
> *–Roger Ebbage, Director of NEEI*

In secondary education, interest in green technologies at the sixteen school districts in Lane County has been strong for several years. Student involvement ranges from recycling

Business Engagement

Local utilities and businesses value Lane's energy programs and hire its graduates. The Eugene Water and Electric Board (EWEB) gives substantial monetary support to NEEI. Emerald People's Utility District and the Bonneville Power Administration also offer internships, advisory committee members, and instructors to the programs, as does EWEB.

For the Lane weatherization academy project, HACSA contractors such as Emerald Valley Weatherization, Marshall's, Home Comfort, and Premium Efficiency provide internship sites and jobs for the students.

programs to alternative high schools uniquely dedicated to conservation and sustainability. As part of Lane's career pathways efforts, articulated courses in sustainability and water conservation are being developed for dual credit. High school students who take these courses receive both high school and college credits and are on track to enter one of the college programs.

The Lane Summer Youth Career Academy in Weatherization teaches young people how to evaluate energy use in residential buildings and perform weatherization techniques to improve efficiency. Participating students receive 40 hours of instruction and are paid for 100 hours of cooperative education work experience in the field. Upon successful completion and a passing grade on the exam, the students are able to earn a residential energy analyst certificate of completion that may be recognized by the community action programs and utility contractors responsible for housing weatherization programs. The students also earn college credit for the courses in Lane's energy management degree program and for their cooperative education work experience. These credits can also be applied to high school requirements.

The career pathways (from entry level to advanced) are:

1. Residential weatherization installer—40 hours
2. Residential energy auditor/inspector—120 hours
3. Commercial energy auditor—three to six months, including intensive field work

These career pathways all result in industry-recognized certifications and lead to associate degrees in energy management.

Funding

The American Recovery and Reinvestment Act (ARRA) has provided a unique opportunity for Lane Workforce Partnership, the county's Workforce Investment Board, to fund a summer youth academy at Lane Community College in the area of green jobs training. The Eugene Water and Electric Board also provides funds, as do the program's business partners. (See "Business Engagement.")

Results

NEEI's associate degree program has tripled over the last three years and virtually all of its graduates have found jobs. Results from the academy program will be available in late fall 2009. Performance will be measured on the number of students who continue their education and/or are employed in the field. Approximately 40 percent of the academy cohort is "out of school" youth who seek to further their education.

Lessons Learned

Career pathways bring academic subjects to life. In this program, students who once claimed that math was not a strong area for them have no trouble learning the subject within the context of weatherization. Students also realize for the first time that they are in control of their own energy consumption—a valuable life lesson.

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Healthcare

Adult Career Pathways in Health Sciences

Southwest Wisconsin

Partners

Blackhawk Technical College, Southwest Wisconsin Workforce Development Board, Dean Health Care, Mercy Health Care, Monroe Clinic, and Beloit Memorial Hospital and Clinic

Challenges

Blackhawk Technical College in southwest Wisconsin is one of the smallest technical colleges in the state. Yet this past year the college served one of the largest dislocations of automotive industry-related workers in Wisconsin history. This was due to General Motors plant layoffs and subsequent closing, which had a snowball effect on supplier companies. Approximately 758 automotive industry-related employees enrolled during the fall and spring semesters of 2008–2009. At least half of those were enrolled in health sciences career pathways. The college took on the challenging task of enabling former automotive workers to gain marketable skills as certified nursing assistants (CNA), licensed practical nurses, phlebotomists, and clinical laboratory assistants.

> "This training gives me an opportunity to go into the field that has always interested me. For sure I will continue my education to become a medical assistant."
>
> *–Former GM employee and 52-year-old mother of four, enrolled in CNA/phlebotomy*

Target Population and Eligibility

The target population consists of displaced workers in the automotive and related industries. The college works with the Southwest Wisconsin Workforce Development Board (SWWDB) to identify and certify workers as eligible for either Workforce Investment Act (WIA) or Trade Adjustment Act (TAA) training dollars. Each eligible recipient can receive funding for a maximum of two years.

Strategies

Enrollees take placement tests to determine reading, writing, and math skill levels. The range of skill levels is broad, from adult basic education and remedial to college level. For students who test two categories below college level, there is not enough time within the funding window to enroll in two-year programs, as the developmental courses consume at least one semester of their time at the college. Therefore, many enroll in diploma programs that are shorter in duration, such as CNA and phlebotomy.

In addition to confirming eligibility for assistance, SWWDB helps to determine occupational interest and aptitude. Workers often look for the highest-paying occupations to replace their former salaries, without realizing the rigor of the required coursework. Case managers approve funding only for program areas that are consistent with aptitude, as determined by the *Job Fit* test. Chosen program areas are then discussed at the college with career counselors.

Many within the target population experience the stress of being unemployed and starting college after many years. Some are convinced that they are not "college material" and don't know what to expect. One of the orientation tools used by the college is a Student Success course designed to teach students how to do well as newly enrolled college students. This one-credit course introduces students to time management, goal setting, teamwork, communication skills, and the expectations of teachers and employers. While almost all students benefit from the course, the time management module has proven to be particularly helpful to the population targeted by this program because many have never had to pay close attention to how they spend their time. As participants in the program, they must carve out

Business Engagement

A critical step in designing the program was to determine specific areas of need and opportunity among healthcare providers in the area. Partners Dean Health Care, Mercy Health Care, Monroe Clinic, and Beloit Memorial Hospital and Clinic helped the college identify those areas.

homework time from their busy family lives. Pilot groups took the six-week course in the previous fall and spring. The student evaluations indicated that the time management instruction was very valuable.

During the fall semester, the college reached capacity in most open-enrollment healthcare classes that meet between 8:00 and 2:30. Further, many students were already waiting to get in before the dislocated workers arrived. This led to discussion with the SWWDB about contracting for cohorts or learning communities of students. In this format, groups of fifteen take classes off sequence in general education and career areas at times when classrooms and labs are available. Accelerated cohorts have been developed in licensed practical nurse, medical assistant, sociology, written communication, certified nurse assistant, and phlebotomy. CNA/phlebotomy as a dual track is particularly important for this population because it allows students to choose between patient care and clinical work. Participants must adjust to their new full-time student status (four days a week). Also, because of the accelerated nature of this programming, tutoring services have been added.

Results

As the college approaches its second year of major enrollment increases resulting from automotive industry-related closures, it is evaluating its experiences with health sciences career pathways to determine which workforce needs in the region remain unmet.

Funding

The program is funded largely by Workforce Investment Act (WIA) and Trade Adjustment Act (TAA) training dollars. The Southwest Wisconsin Workforce Development Board (SWWDB) helped the college to identify and certify workers as eligible for these programs. Recipients must enroll in programs, not just courses, to receive tuition and book vouchers. Recipients are eligible for only two years each, and the clock starts ticking when instruction begins.

Blackhawk Technical College received a congressional allocation for educational activities for dislocated workers for the coming year. One healthcare area that still has high-demand, high-wage jobs is clinical laboratory technician (CLT). With 80 percent of the current students identified as dislocated workers in the one-year laboratory technician assistant program, the college will use the grant money to continue these students as a learning community in CLT.

Lessons Learned

The program underscores the importance of acquiring basic skills such as computer skills early in life. Many in the first group of prospective students for this program had no experience with word processing or using a computer keyboard. This presented a challenge from day one, as they did not have the skills necessary to complete their coursework. The president of the college has authorized staff to do one-on-one tutoring for one-hour sessions during the day, until additional tutors can be added.

BLACKHAWK TECHNICAL COLLEGE

Southwest Wisconsin WORKFORCE DEVELOPMENT BOARD

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Healthcare

Brunswick County Health Sciences Career Pathway

Supply, North Carolina

Partners

Brunswick County Schools (BCS), Brunswick Community College (BCC), Brunswick Community Hospital, Dosher Memorial Hospital, and Brunswick County Health Department and Emergency Management Services, as well as numerous local medical practices, health care facilities, emergency service providers, public services agencies, and community organizations

Target Population and Eligibility

Students are exposed to health sciences careers in the ninth and tenth grades. Eleventh- and twelfth-grade students apply for participation in job shadowing and internship opportunities. Tenth-, eleventh-, and twelfth-grade students can register for allied health courses; students with a final grade of B or higher and 80 or higher on the end-of-course exam qualify for articulated college credit. Students continue in heath science programs (e.g., health information technology, phlebotomy, and certified nursing assistant) at the community college level. Students are admitted to the practical nursing and registered nursing programs based on a point system and test scores.

Challenges

Because Brunswick County, North Carolina, is a retirement destination, the area's aging demographics presents a growing need for medical services. BCC's expanded nursing program provides qualified, much-needed nursing candidates for Brunswick Community and Dosher Memorial Hospitals.

Strategies

The BCS-BCC Tech Prep Consortium strives for a comprehensive approach to worksite learning in health sciences. The health sciences curriculum prepares high school and community college students to locate, secure, keep, and change careers in the health sciences arena by enabling students to evaluate their career selections, demonstrate employability skills, and perform work-related competencies with real-time feedback from business leaders through work-based learning activities.

The Brunswick County health sciences program includes career exploration beginning in the ninth grade, health sciences courses articulated with the community college, job shadowing and internships for high school students, certificates and associate degrees for postsecondary students, and professional development and paid internship opportunities for educators.

Allied health students are encouraged to pursue the national Career Readiness Certificate by participating in the WorkKeys job skills assessment system. Employers serve on secondary and postsecondary advisory boards and participate in institutional effectiveness surveys at BCC. All participants, including employer partners, are asked to provide feedback through written evaluations.

> The job shadowing experience taught me many things and most importantly it made me realize that physical therapy is definitely the career I want to pursue!"
>
> *–Jenna Beyer, South Brunswick High School*

Results

The program has improved high school students' preparedness to make career choices in health sciences. Student improvement is indicated by data showing that, statewide, 12 percent more students graduate from high school after taking Tech Prep courses that involve work-based learning. Other positive signs are increases in the number of students who obtain industry-related certificates and degrees, along with increases in student employment as a result of work-based learning experiences.

During the 2007–2008 school year, 55 high school students job-shadowed at 37 businesses; three high school students participated in internships. Fifteen high school educators participated in the summer internship program at eight businesses. The number of articulated college credits earned by health sciences students in 2007–2008 increased 100 percent. The number of health sciences students who scored at or above level three (out of four) on the CTE end-of-course exam increased 21 percent.

Business Engagement

Employer and community partners support Career Ready Council activities by participating in career fairs, site tours, job-shadowing activities, the internship program, and CO-OP opportunities, and by teaching business attire, etiquette, and communication skills prior to worksite visits. Employer partners are invaluably involved with high school students through in-services and the healthcare careers symposium. Employers serve as judges on high school students' senior projects and are active with the high schools' Health Occupations Students of America (HOSA) chapters.

Brunswick Community Hospital and Dosher Memorial Hospital support BCC's program by allowing students to practice nursing skills in clinical settings. Nursing students observe professionals in settings such as home healthcare agencies, medical offices, and urgent care facilities. Dosher Memorial Hospital's senior vice president and chief operations officer serves as chairperson of BCC's board of trustees.

Funding

Funding from the North Carolina Tech Prep Enhancement grant was instrumental in many of this initiative's activities. Many employer partners sponsor college scholarships. Some partners encourage students to pursue associate and bachelor's degrees by paying for their tuition and books, if the students will agree to work for those partners. Several local medical practices employ program students after they have completed their clinicals. During spring and summer breaks, businesses provide paid internships for BCS and BCC educators.

Plans are in place to increase business participation, in part by funding received through the 2008–2010 North Carolina Tech Prep Enhancement Grant.

BCS and BCC jointly fund a liaison position that facilitates collaborative activities. BCS funds a Career Ready Council coordinator to coordinate work-based and school-based career-related activities for both students and educators. BCC provides in-kind office space for the Career Ready Council coordinator.

Lessons Learned

Success depends on the involvement of top-level administrators and business representatives. It takes two to three years of steady effort for career pathways programs to succeed. The keys to success are consistency, persistence, and patience.

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Logistic and Supply Chain Technology Education

Dayton, Ohio

Partners

Employer collaborators: Wright-Patterson AFB, Warner-Robins AFB, Alien RFID Solution Center, Stratum Global, Long Beach Port/DH Warehouse, UPS, Honda, Boeing, United States Department of Defense, Dayton Area Chamber of Commerce, Dayton Development Coalition, and other local and national professional organizations

Higher education collaborators: Miami Valley Acquisition Consortium (MVAC), an academic, government, and industry partnership. MVAC schools: Cedarville University, Central Michigan University, Central State University, Clark State Community College, Defense Acquisition University, Edison State Community College, Embry-Riddle Aeronautical University, Indiana Wesleyan University, Sinclair Community College, University of Dayton, Wittenberg University, Wright State University. Other participating colleges: Riverside Community College, Long Beach Community College, Cal Poly Pomona, Cal State, Oakton Community College, Del Mar College

Tech Prep collaborators: Ohio Department of Education, Ohio Board of Regents, Miami Valley Tech Prep Consortium, Upper Valley Tech Prep Consortium, and Clark State Tech Prep Consortium

> "This program is perfect for students who want a career in business. You work with state-of-the-art technology on a daily basis. . . . I am very excited about this opportunity and the wonderful opportunities that await." *–Student*

Target Population and Eligibility

The secondary Tech Prep pathway begins in the 11th grade with a recommended grade point average of 2.0 and a C or better in Algebra I. The postsecondary pathway begins after earning a high school diploma or GED and includes adult learners. For journeyman positions, the program works with displaced holders of MBA and other master's degrees.

Challenges

The acquisition workforce faces a looming crisis. Much of the Pentagon's highly skilled technical workforce is at or nearing retirement age. Experts predict that by 2015, 54 percent of the federal government's acquisition workforce will be eligible for retirement. The Department of Defense's (DoD) acquisition, technology, and logistics workforce consists of 135,000 specialists such as engineers, program managers, contracting officers, testers, and cost analysts. About 118,000 are civilians.

A 2008 summit of logistics business and industry leaders identified the workforce challenges they face. Participants also determined that fewer positions will be available for unskilled workers as automation increases. More semiskilled workers possessing math, basic business, technical, and teamwork skills will be in demand over the next three to five years. There is also a shortage of supervisory-level employees with the operational management, basic accounting, and performance systems skills necessary to handle their organizations' increasingly complex operations.

Strategies

In 2002 the Miami Valley Tech Prep Consortium (MVTPC) noticed that, even though over 6000 professionals were working in DoD acquisition, there was no secondary linkage aimed at providing the next generation of workers. The procurement, acquisitions, logistics, and supply chain management (PALS) pathway provides that linkage.

Sinclair upgraded its procurement degree program to an AAS with a concentration in supply chain management (SCM) and added one-year and short-term certificate programs in SCM. Defense Acquisition University (DAU) certification courses are used in the acquisitions and logistics management short-term certificate programs. Other DAU certification courses are taught to federal agencies and contractors through Sinclair's business division.

Recruitment and hiring of interns (college co-op students) and journeymen (experienced professionals) has begun. The intern program is intended to provide a long-term

means of replacing the aging workforce. Journeymen will help fill intermediate positions. This can also help provide opportunities for employment for displaced professionals who already have relevant bachelor's or master's degrees.

Results

MVTPC had fourteen academic-technical pathways during the 2008–2009 school year, with enrollments of 3761 high schoolers (grades 11 and 12), 1470 students at Sinclair, and more than 850 students at other two- and four-year state colleges. There were 1416 business and IT students in the high school pipeline who could enter the postsecondary logistics and supply chain management degree programs. Based on data from the October 2007 study from Sinclair's Office of Research, Analytics, and Reporting, incoming Tech Prep students outperform their peers on these measures:

- Passage rates on placement exams
- Lack of need for remediation
- Performance in first English and math classes

Funding

A Tech Prep pathway in procurement, acquisitions, logistics, and supply chain management (PALS) was created in 2003 with a $5000 grant from the Ohio Department of Education and Ohio Board of Regents**.** This document is being updated by MVTPC with a $10,000 grant from the Ohio Department of Education. Defense Acquisitions University (DAU) provided $500,000 for a trial program for Wright-Patterson AFB acquisition co-ops through the Student Career Experience Program in 2004. In 2005 the Ohio Learning Network awarded MVTPC and Sinclair a $10,000 grant to convert noncredit DAU courses to community college credit courses.

In 2008 Congress created a fund under the Defense Authorization Act to help DAU train its acquisition workforce ($600 million a year beginning in FY 2010).

Business Engagement

Educational partners—high school Tech Prep consortia, community colleges, and universities—are linked via 2+2+2 programming that spans high school diplomas, certificates and associate degrees, and bachelor's degrees. Business partners are involved in distribution, transportation, warehousing, port operations, and security. Technologies such as geographical informational systems (GIS), global positioning systems (GPS), radio frequency identification (RFID), data warehousing, enterprise resource planning (ERP), and data security permeate the supply chain.

- Cumulative grade point average
- Retention from year 1 to year 2 of the college program
- Graduation and transfer to four-year schools
- Ability to secure employment

Lessons Learned

Logistic and supply chain management is not limited to the transportation and logistics career cluster. It also involves clusters such as business management and administration, finance, IT, marketing, and STEM (science, technology, engineering, and math). Every business has a supply chain, and every link must be managed. The greatest challenge facing the logistics industry over the next five years is the lack of a skilled workforce, especially in the federal government. Workers will be challenged to upgrade their skills to keep pace with changes in technology. They will be expected to arrive at college with stronger math, science, and technology skills and a better general knowledge of engineering and industry.

Sinclair Community College

ACADEMIA • GOVERNMENT • INDUSTRY
MVAC
Miami Valley Acquisition Consortium
Preparing the Right Workforce for Tomorrow

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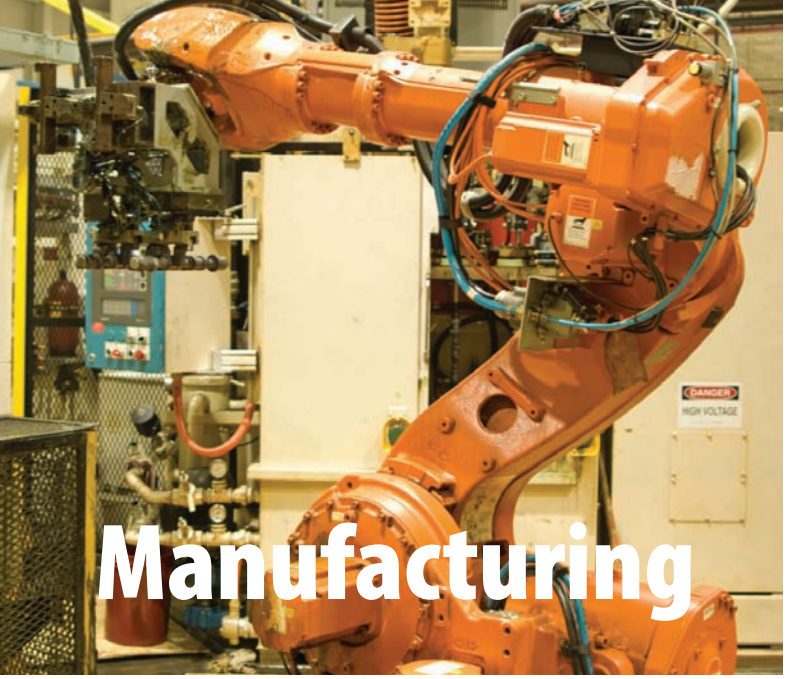

Manufacturing

Discover Mechatronics – Next Generation Manufacturing

Owensboro, Kentucky

Partners

Owensboro Community and Technical College (OCTC), Owensboro Museum of Science and History, Kimberly Clark, Domtar, The Hines Group (Premium Allied Tool and Owensboro Manufacturing), Texas Gas, Tennessee Valley Authority, Owensboro Municipal Utilities, Hancock County Public Schools Maintenance, Southern Star, OCTC Maintenance, Hayden Electric

Target Population and Eligibility

Discover Mechatronics is open to elementary, middle, and high school students, including females, minorities, and students with disabilities. There are no prerequisites.

Challenges

Manufacturing is becoming a highly technical field that requires a highly skilled workforce. In the Greater Owensboro region of western Kentucky, manufacturing accounts for 20 percent of the workforce and the highest paying jobs in the area. Employers need a pool of qualified, highly skilled workers to fill positions that will become available as the current workforce retires. The mission of Discover Mechatronics is to create a pipeline that enables members of the region's diverse student population to transition from high school into postsecondary manufacturing programs and on to careers.

Strategies

The overall thrust of the Discover Mechatronics project is to engage young people in manufacturing by exposing them to *mechatronics*—electrical, mechanical, and computer systems. Participating students and teachers learn to build and operate Lego Mindstorm robots through four primary means: (1) dual enrollment in Siemens's Mechatronics Level 1 certification for high school juniors and seniors, (2) participation of K–12 students in Mechatronics clubs through a partnership with the Owensboro Museum of Science and History, (3) participation of middle and high school students in Mechatronics summer academies, and (4) professional development for K–14 teachers. These components provide opportunities for young people to become engaged in advanced manufacturing at all levels of the K–14 continuum.

Mechatronics clubs are the most innovative and successful aspect of the project, with over 200 students engaged through twelve schools and community organizations. Each club is led by a teacher or sponsor recruited through Mechatronics professional development events. Students are recruited through the summer academies. OCTC faculty and staff facilitate student-teacher engagement with hands-on, interactive activities, materials, and supplies that each club then implements during the academic year. Clubs receive information about career opportunities through campus visits and industry tours.

> "Discover Mechatronics strengthens independence. Kids who hate science love this, and it lets my students with special needs shine. It also provides students with exposure to people working in the field and to a college campus."
>
> *–Mechatronics club leader and FLL coach*

Through the project, OCTC has implemented intensive recruitment efforts among underrepresented groups such as females, minorities, and people with disabilities. The college has also hosted activities for specific groups, for example, Mechatronics summer academies for high school females through collaboration with Girls, Incorporated and for minority students through the Kentucky Governor's Minority Student College Preparation Program. Initial data indicate that these efforts are paying off.

OCTC has partnered with the Owensboro Museum of Science and History (OMSH) to host the *FIRST* (For

Inspiration and Recognition of Science and Technology) LEGO League (FLL) competition for elementary and middle school students. OCTC is taking steps to open the competitions to Mechatronics clubs at the high school level. The competitions provide an effective way to recruit industry involvement. OCTC and OMSH invite industry partners to serve as judges. This involvement has led to an increase in industry tours and industry participation in the summer academies and teacher professional events. Kimberly Clark, Domtar, Premium Allied Tool, Tennessee Valley Authority, Southern Star Central Gas Pipeline, and Texas Gas are just a few of the industries that have supported the project locally.

Business Engagement

The program's business partners offer several essential services. For example, they provide tours and speakers, hire co-op students, and provide representation on the program's advisory committee. The Owensboro Museum of Science and History works with the advisory committee in carrying out grant-related activities. The museum has hosted a regional robotics competition (an effective tool for student outreach) and is exploring ways to expand the competition's reach. Texas Gas provides volunteers for the robotics competition. The interaction of those volunteers with students improves the students' preparation for the state competition.

Discover Mechatronics

Funding

The program is funded by a grant received through the National Science Foundation's Advanced Technological Education program.

Results

The program has increased the involvement of business and industry personnel through their work with clubs, summer academies, and internships and has positively impacted enrollment and retention.

Although only in its third year of operation, the program has already proven successful in engaging young people in activities designed to help them become aware of opportunities in advanced manufacturing. To date, 57 students have participated in dual-enrolled Mechatronics certification, 210 in Mechatronics clubs, and 76 in Mechatronics summer academies. Likewise, 119 teachers have participated in professional development offerings. The project's success will be determined over time as the number and diversity of participants increases.

Lessons Learned

Discovering Mechatronics has demonstrated the need for enthusiastic and energetic faculty support. Prior to embarking on a project such as this, project leaders should seek support from faculty members at both participating postsecondary institutions and surrounding schools. Where public school teachers are involved, time and money issues can often present barriers, but these can be overcome.

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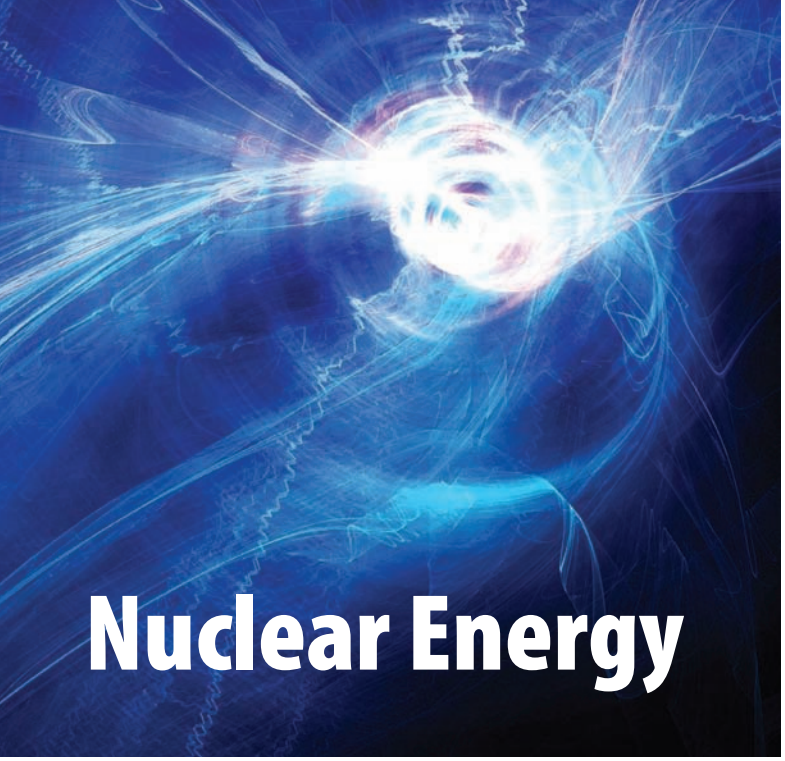
Owensboro Museum of Science and History

Owensboro Community & Technical College
HIGHER EDUCATION BEGINS HERE



Nuclear Energy Career Pathway Program

Lynchburg, Virginia

Partners

AREVA NP Inc., Central Virginia Community College (Lynchburg), University of Virginia, The Center for Advanced Engineering and Research (CAER), and multiple local school districts

Target Population and Eligibility

Middle and high school students in the school divisions of Amherst, Appomattox, Bedford, and Campbell Counties and the city of Lynchburg

Challenges

The national shortage of skilled workers in the nuclear energy field is well documented. The presence of a global nuclear industry in the central Virginia area is an outstanding opportunity to produce and employ well-educated new technicians and engineers from the local population.

Strategies

The pathway first introduces middle school students to nuclear studies and related robotics through Virginia's largest Lego Robotics competition. These competitions teach problem-solving skills while fostering teamwork. During the summers, both middle and high school students can participate in the Summer Career Academy. Each academy camp involves a week of career-related activities, often at local worksites, and some students earn professional certifications through their academy participation. Now in its 11th year, the Summer Career Academy includes 19 career camps.

High school students earn college credit in dual-enrollment courses, including courses in nuclear technology. Some of the more ambitious students compete for summer apprenticeship opportunities with AREVA NP. This provides opportunities for AREVA NP to hire entry-level technicians on a trial basis and helps participating students to prepare for the workforce. The program provides an essential pathway to careers in the nuclear power industry by helping to identify and train engineers and technicians for maintenance of nuclear power plants and construction of new plants.

Following high school graduation, students have multiple options. For example, they can begin immediate employment with AREVA NP as nuclear technicians, earning pay and on-the-job experience while continuing their technical educations, or they can go directly into engineering studies.

Successful CVCC engineering graduates have the opportunity to continue their studies at the University of Virginia's School of Engineering and Applied Science for their four-year degrees—without leaving the local area. Through a growing program piloted by the CVCC/AREVA NP partnership, the University of Virginia will offer the same engineering degree possibility in roughly half of Virginia's community college service regions beginning this fall.

Results

Notable program results include:

- 1456 high school students have received dual enrollment credit in at least one course in nuclear technology.
- 1185 middle and high school students participated in STEM modules related to the nuclear industry.
- Over 350 middle and high school students have attended summer camps and participated in internships.
- 525 high schools students have taken skills assessments for the nuclear industry.
- 400 middle school students participated in a science and technology reading program.
- Teachers have participated in 48 workshops and conferences in health physics and energy.
- Students are completing AAS degrees in engineering at CVCC and are continuing their engineering studies with the University of Virginia.

Business Engagement

CVCC has forged a strong partnership with AREVA NP Inc., an international company that provides services, fuel, and engineering support to nuclear plants throughout the world. AREVA NP's North American headquarters is located in Lynchburg. AREVA NP and CVCC jointly developed the Nuclear Energy Career Pathways program.

Participating students who choose engineering studies often gain corporate sponsorship. Of the initial 144 students, 73 received some form of pay, tuition reimbursement, or similar benefits. Students who are not corporately sponsored compete for abundant merit-based scholarship funding.

AREVA NP's contributions have been substantial. The company donated $1 million to CVCC for a new on-campus, 35,000-square-foot AREVA Technology Center. AREVA NP also invested $12 million in a corporate technical training center that CVCC uses for classes pertaining to nuclear energy. The center has the capacity to train up to 1000 nuclear technicians a year. AREVA NP supports a contract employee training program that includes full tuition and full-time employment. In a related effort, the partnership provides technical support for a dual enrollment program in nondestructive evaluation.

Funding

In addition to the significant AREVA NP contributions mentioned, Virginia's governor awarded the partnership $300,000 of his 2008 discretionary funds. The National Science Foundation supports the effort with a $2 million grant.

Lessons Learned

The two most important lessons learned are that local problems are most effectively addressed through local solutions, and that bringing concepts to reality requires persistence and hard work.

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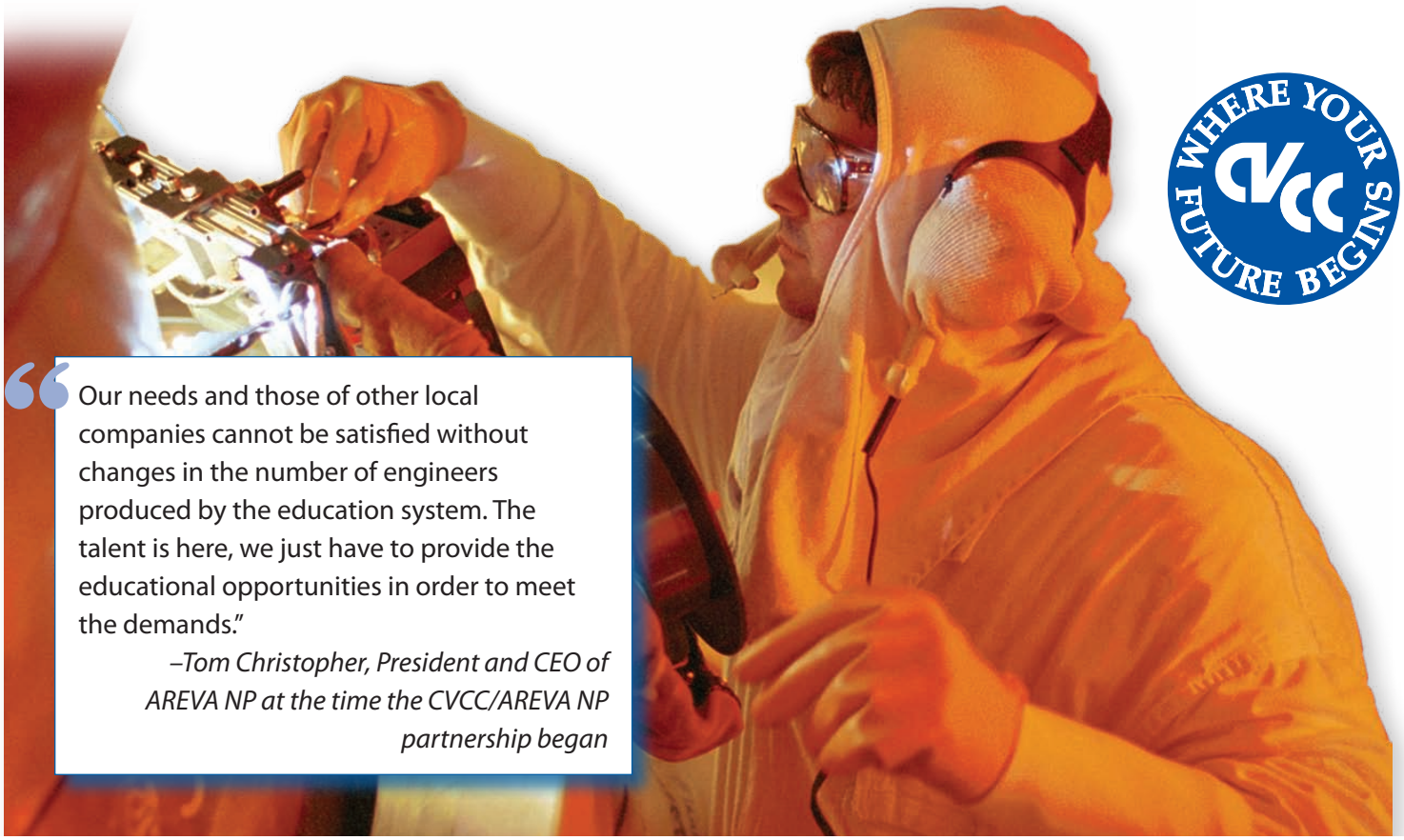
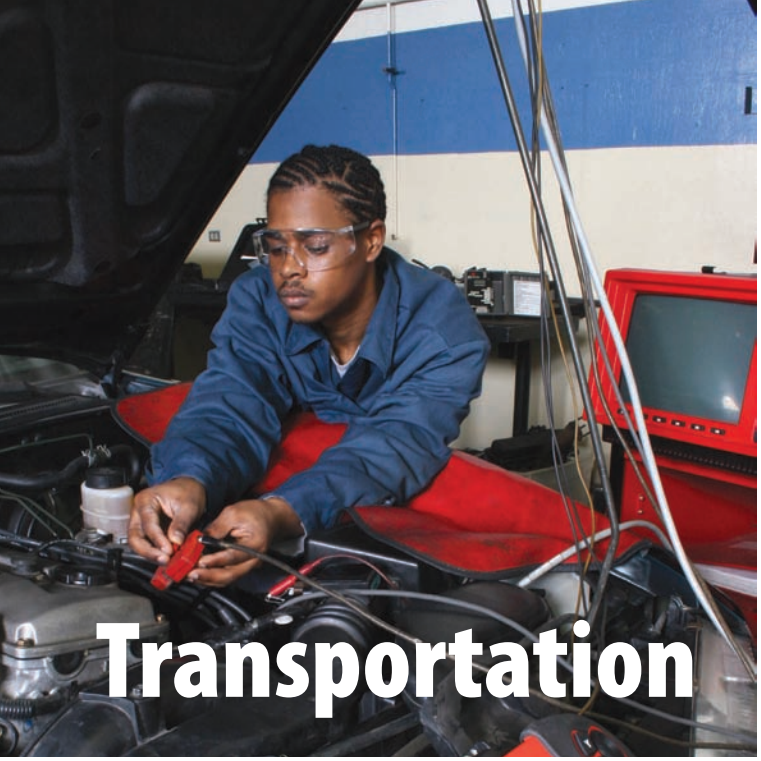


"Our needs and those of other local companies cannot be satisfied without changes in the number of engineers produced by the education system. The talent is here, we just have to provide the educational opportunities in order to meet the demands."

–Tom Christopher, President and CEO of AREVA NP at the time the CVCC/AREVA NP partnership began



Transportation

Horizon Center for Transportation Technology

Kenosha, Wisconsin

Partners

Gateway Technical College (GTC), Snap-on Incorporated, Kenosha Unified School District No. 1, Bumper to Bumper, Chrysler, Colerget, First Technologies Inc., Foundation of the Wisconsin Automobile and Truck Dealers Association, Garbo Motors, Gentile Automotive Group, Goodheart-Wilcox Publisher, JayBee, Johnson Bank, Kenosha Area Business Alliance, Kenosha County, L.J. Create, Lynch Automotive Group, Mahar Tool Supply Co., Modine, Palmen Motors, Partners in Design, Walworth County Economic Development Association, Wisconsin Department of Workforce Development, Toyota USA, Chrysler, Automotive Youth Educational Systems, U.S. Department of Labor, U.S. Department of Transportation, Melior, Inc.

Target Population and Eligibility

The Horizon Center for Transportation Technology serves students in GTC's transportation programs—automotive technology, diesel technology, and aeronautics-pilot training—as well as area high school juniors and seniors who participate in those programs through dual credit courses. The center is also used for professional development in proprietary automotive technologies, train-the-trainer programs, seminars, and other meetings.

Challenges

The idea of establishing a regional training center serving the transportation industry had two objectives: position the Kenosha community to meet the demands of the increasing career markets in the Milwaukee-Chicago corridor and honor the history and tradition of the automobile industry in southeastern Wisconsin.

Strategies

The Horizon Center is a state-of-the-art training facility designed to meet the needs of the transportation industry in Southeastern Wisconsin. Students in the center's automotive pathway obtain the hands-on mechanical skills of automotive technicians, along with strong computer, electronic, and science skills.

In addition to enabling postsecondary students to obtain associate degrees in transportation technologies, the center offers an aligned transportation career pathway for high school students. The center's transportation curriculum seamlessly guides the student through high school and college and into the workforce. Students in automotive technology can take nearly a full year of the associate degree program while still in high school and finish in less than two years at GTC. A project website (www.upgrade2cert.org) serves as a portal for online training.

The center is also home to Gateway's associate degree program for aeronautics-pilot training, which specializes in both single and multi-engine training.

> "Leadership must come from all corners for a region to be successful, and you're fortunate that Gateway Technical College has risen to the occasion. Their High Growth grant was a little less than a million dollars, and they could have been satisfied with simply producing the curriculum and training program that had been outlined. [But they were able to leverage an additional $2 million from the private sector to build a state-of-the-art center.] It is a functioning demonstration of the classroom of tomorrow, where coursework is electronic and students blend classroom learning and hands-on work."
>
> *–Emily DeRocco, former Assistant Secretary of the Department of Labor's Employment and Training Administration*

Business Engagement

Many partners including several local dealerships and companies, especially Snap-on Incorporated, have stepped forward to donate time, resources, and financial support for student and faculty development scholarships (http://education.snapon.com/).

Snap-on's impact on the center can be seen in many ways. In addition to contributing financially, it has brought its experience and vision of the future of the transportation industry into the planning process. It has also donated equipment, expertise, and the intellectual capital it has gained as an industry leader. Snap-on trains GTC instructors so that they can teach students how to use the company's tools at a very high level.

The Wisconsin Department of Workforce Development has also remained a strong partner in the Horizon Center and its programs as the college moves forward to develop new and evolving pathways.

Funding

Many industry partners have contributed to the program, especially Snap-on Incorporated. In addition, in October 2004, Gateway received a $900,000 "Upgrading the Nation's Automotive Programs" grant from the U.S. Department of Labor's Employment and Training Administration. The purpose of the grant was to increase the number of NATEF/ASE-certified automotive instructors and certified automotive training programs across the country.

Through the office of Wisconsin Department of Workforce Development Secretary Roberta Gassman, GTC received a $25,000 Grow Wisconsin grant that supported the training of instructors, as well as students and incumbent automotive technicians, to become certified automotive diagnostic technicians. Matching the grant were $25,000 contributions from Snap-on Incorporated, Kenosha County, and GTC.

Results

The Horizon Center and its programs measurably impacted students and the community in its first year of operation. A total of 809 students took automotive technology courses, 111 took Snap-on diagnostics certification training, and 52 took aviation courses. The center welcomed 2091 visitors who were there for training events, conferences, and other transportation-related seminars and student camps. A total of 2330 instructors have been trained through the center's website (www.upgrade2cert.org). The job placement rate for graduates is high, and they earn excellent wages. Gateway also broke ground August 20 on its 12,800-square-foot Advanced Propulsion Training addition to the Horizon Center, which will expand opportunities for diesel technology students and area employers, as well as qualified technicians in diesel hybrid and alternative fuel industries.

Lesson Learned

This project demonstrates the value of partnerships and the importance of including the community from the outset. Strong partnerships and community involvement create a broad base of support and help to ensure that the project meets the needs of the constituents it is designed to serve.

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The programs described on this and the next five pages are designed to prepare students for multiple industry sectors.

Adult Career Pathways

Adult Career Pathways Program

Fort Pierce, Florida

Industry Sectors

The program addresses six clusters identified by the States' Career Clusters Initiative: health science; finance; institutional technology; law, public safety, and security; marketing, sales, and service; and science, technology, engineering, and math (STEM).

Partners

Indian River State College (IRSC), Research Coast Career Pathways Consortium, Workforce Solutions, One Stop Career Center, Region 20 – Workforce Development Board of the Treasure Coast, Community Coordination Coalition, numerous community-based organizations that provide services for TANF recipients (Examples include Mustard Seed and the Jesus House of Hope, Early Learning Coalitions, United For Families, Helping People To Succeed, Boys and Girls Club, YMCA, Gulfstream Goodwill, Learn to Read, Weed and Seed Initiative, and Saint Lucie County Jail.)

Target Population and Eligibility

Any adult education student can participate in the IRSC career pathways program if he or she (1) is enrolled in one of the college's adult education programs, (2) is at least 16 years of age, (3) attends classes regularly, (4) has achieved grade level six or above on the TABE assessment, (5) completes the career academy orientation and agrees to adhere to its requirements, (6) completes the entrance application for one of the six career academies, (7) complies with IRSC's adult education student code of conduct, (8) agrees to meet regularly with a career academy coordinator, and (9) completes an entrance interview. The program serves residents of Indian River, Martin, Okeechobee, and St. Lucie Counties.

Challenges

In 2005, the general consensus regarding the existing IRSC adult education program was that the program was transitioning substantial numbers of students but in an inefficient manner. The existing program was also segmented into GED and ESL areas. The challenge was to identify and implement a more integrated system that would eliminate segmentation and better support students and enhance seamless transitions. The new career pathways program allows each student to choose a pathway and enables the college to serve an even greater number of learners while supporting both the GED and ESL areas.

Strategies

The IRSC adult career pathways program was designed to enable career-limited adults to return to school and acquire the foundational knowledge and skills necessary to improve their employment situations and/or to enter postsecondary programs at IRSC. Students in the program can choose from six adult career pathways academies: Business, Green Jobs of Florida, Industrial, Pre-health, Public Safety, and Technology. The academies provide one-on-one academic guidance and career counseling; rigorous, relevant, collaborative, and innovative classroom instruction; on-

Funding

The program is supported by the IRSC Foundation, in addition to the Carl D. Perkins Career and Technical Education Improvement Act of 2006 (Perkins IV).

site enrichment; and service learning opportunities. Each pathway is tailored to the student's needs. The goal is not to prepare students to earn high school diplomas or GEDs as terminal credentials but to provide purposeful beginnings on pathways that will provide multiple exit points.

The program is designed to facilitate transitions by providing six components—each with a corresponding outcome, indicated in parentheses: career goal (direction), career plan (purpose), general education (foundation), technical education (skills), career education (mobility), and career training (growth).

Participating students are involved in frequent special events such as tours, orientation and information meetings, programs involving guest speakers, and the Brain Bowl (pictured on the preceding page), a competition in which

> "Students come to IRSC with a mission to obtain their education and to transition into a postsecondary program or a job. Career pathways enable the students to realize their goals and to achieve them with purpose."
>
> *–June Rall, ESL developer/trainer*

participants demonstrate their academic knowledge, quick thinking, and teamwork skills. Winners are awarded textbook scholarships by the Indian River State College Foundation.

A personal growth curriculum was developed to provide postsecondary and career foundations specifically for adult learners. Dual and concurrent enrollment opportunities are available, and the program provides special assistance for students who speak English as a second language.

Results

The adult education program at IRSC has transitioned 59.2 percent of its adult high school students over the past year through dual enrollment. Project personnel anticipate a significant increase in students' postsecondary and career transitions through the adult career pathways program.

The program is making strides in improving the quality of the region's workforce. The Research Coast Career Pathways Consortium was established to streamline conformance to local and state mandates to align PreK–20 institutions with business and industry standards by working with industry partners to identify alignment between targeted sectors and secondary and postsecondary programs. The IRSC adult career pathways program is enhancing that alignment by helping local business and industry to develop a capable local workforce.

Feedback and assessments suggest a positive shift in culture in the areas of collaboration, professional development, student facilitation, and classroom instruction.

Business Engagement

The success of the IRSC adult career pathways program is a direct result of the services and support of local business partners. *Examples:* Workforce Solutions provides student support in the areas of tuition, transportation, childcare, training tools, and uniforms. The local One Stop Career Center provides initial and comprehensive assessments and eligibility determinations, workshops, job search assistance, employability skills training, and job referrals. Numerous community-based organizations provide assistance designed to meet the special needs of returning career-limited adults—childcare, transportation, and other personal needs.

Lessons Learned

According to the collective experiences of the administrators, educators, and other personnel associated with this program, the development of similar programs should be guided by the following points. (1) Identify stakeholders and/or partnerships. (2) Grow from the inside out—*internal* stakeholders and partnerships are key. (3) Communicate all objectives clearly. (4) Carefully determine the role of each stakeholder and partner. (5) Establish small teams to address areas of planning and administration. (6) Strive to maintain effective collaboration. (7) Conduct internal evaluations.

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IRSC
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College Express
Danville, Illinois

Industry Sectors

Auto body, auto mechanics, computer networking, criminal justice, culinary arts, drafting, early childhood education, electronics, graphic design, health occupations, HVAC, horticulture, manufacturing, marketing, welding

Partners

Danville Area Community College (DACC) is an accredited public two-year college providing higher education opportunities for over 8000 youth and adults in East Central Illinois annually. The college district encompasses an estimated population of 89,000.

Vermilion Vocational Education Delivery System (VVEDS) is a consortium of Vermilion County public school districts created to coordinate career and technical education (CTE) programs, services, and activities.

Thirteen school districts within the DACC district are partners in the College Express program.

More than 150 businesses participate with the College Express program. These include Provena United Medical Center; Carle Clinic; Illiana Healthcare/Veteran's Administration; Nexlan; Danville Police Department; Vermillion County Sheriff's Department; Walgreen's – Danville Accounting Center; Alcoa – Danville/Bunge Milling; Danville Metal Stamping; Fiberteq; Mervis Industries, Inc.; NACCO Materials Handling Group; and ThyssenKrupp Company.

Target Population and Eligibility

College Express offers dual credit to over 400 high school juniors and seniors, 16–18 years old, in 15 CTE areas that lead to associate degrees or certificates. The goals are to encourage high school completion, increase postsecondary degree attainment, and provide a skilled workforce.

Optimally, a high school student enters the program as a junior and attends classes at DACC for 1½ hours each day. At the end of four semesters, a student may have earned 12–16 college credits. Health occupations students are prepared to take the Illinois Department of Public Health certification exam and receive their CNA certification.

Challenges

Prior to 2005, CTE in Vermilion County was funded and delivered by VVEDS through the area vocational center, VOTEC. As the number of students and school districts in the consortium dropped, it became difficult to support the vocational center. Reeling from the financial situation, yet committed to providing top-quality CTE alternatives, area superintendents approached DACC to explore new options. DACC agreed to serve high school students on the college campus, but compromise and consideration were required from all parties.

> "College Express classes help you figure out what you want to do and helped me get ready for college. I got to know the campus, found the class work exciting, and earned college credit at the same time."
>
> *–Oakwood High School student*

Strategies

A countywide school calendar was designed and accepted by all partners. The college altered program class schedules for a traditional five-day instruction week but maintained the content and rigor of college-level courses. Extra days were built into the College Express schedule to account for the difference between high school and college instruction days.

DACC charges College Express students half the regular tuition rate. School districts pay tuition and book fees and provide bus transportation. The VVEDS staff coordinates textbook purchasing with the DACC bookstore and, where possible, keeps books for reuse. Students and their families save more than $2000 in college costs.

Courses are determined on the basis of previous VOTEC offerings, student interest, and local workforce need. DACC program advisory committees and Vermilion Advantage Workforce Cluster members, representing more than 150 area businesses and industries, address College Express issues and topics as part of the feedback and input they provide to traditional college CTE programs.

College Express instructors are part-time and full-time DACC faculty. Instructors undergo special training to prepare for work with high school students in a nontraditional course schedule. DACC provides office space for VVEDS staff members who oversee the College Express program, while VVEDS provides special population services, including tutors, for College Express students.

Results

College Express students do well in their college coursework and are more likely to complete associate degrees after high school. Currently, more than 90 percent of College Express students receive a grade of C or better in their classes. While 42 percent of recent high school graduates enroll at DACC, 52 percent of graduates who have completed at least two semesters of College Express classes enroll at DACC. Some students have gone directly into the workforce as a result of their College Express coursework. Because of this partnership, it is no longer necessary to duplicate equipment and lab facilities at secondary and postsecondary sites.

VVEDS
Vermillion Vocational Education Delivery System

Business Engagement

All College Express programs are guided by technical advisory committees that bring together representatives from among more than 150 employers. Advisory committees guide curriculum design and revision and provide mentoring, job-shadowing experiences, internships, and employment opportunities. Advisory committee members also help with equipment selection and donations.

Funding

Funding comes from Danville Area Community College and the high school districts participating in the program. DACC's primary sources of funding are local property tax, state revenue, and student tuition and fees. Secondary schools' main sources of funding are local property tax and state revenues.

Lessons Learned

The partners in College Express have identified two lessons that may be useful to others implementing similar programs.

Look for common ground that best serves the student. Programs such as College Express must be based on student need and built on a foundation of true collaboration. Details can make or break a partnership.

Recognize that change does not take place in a vacuum or overnight. Include secondary and postsecondary staff in all phases of the planning process to build support for the program. Sensitize staff and instructors to the unique issues and needs of high school students.

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Danville Area Community College

Pathways Academy
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Industry Sectors
Information technology, business and financial services, office administration, computerized manufacturing and robotics, automotive service and collision technology, biomedical equipment technology, biotechnology and laboratory technology/allied health, construction management and trades

Partners
Florida State College at Jacksonville (FSCJ), ADT, Anheuser Busch, Atlantic Marine, Beaver Street Fisheries, Blue Cross and Blue Shield, Boys and Girls Club, Chamber of Commerce, Chappell Child Development Centers, City Rescue Mission, Communities In Schools, Division of Children and Families Foster Child Department, DuPont, First Coast Manufacturing Association, FSCJ Foundation, HabiJax, Jacksonville Port Authority, JEA, Jobs for Florida's Graduates, Learning to Finish Collaborative of the Community Foundation, Mayo Clinic, Vistakon, WorkSource

Target Population and Eligibility
Pathways Academy is a public charter high school whose mission is to serve dropouts and at-risk students who have been referred by the Duval County School District. To qualify for admission, candidates must (1) be 16–21 years old; (2) apply for admission; (3) have grade level equivalent (GLE) scores of at least 9 in reading, 7 in mathematics, and 7 in language on the Test of Adult Basic Education (TABE); (4) have acceptable conduct records (no violent offenses); (5) have no felony convictions; and (6) attend orientations.

Challenges
(1) Florida ranks 49th among states in graduation rates. (2) The Duval County graduation rate is 62 percent. (3) Over 17 percent of adults (79,000) in Duval County do not possess a high school diploma. (4) Forty-seven percent of adults have literacy levels below ninth grade. (5) Prisons, public assistance facilities, and social services are dominated by dropouts.

Strategies
Pathways seeks to re-attract, motivate, and engage students in a challenging and exciting whole-life educational environment. Pathways coalesces with local businesses, community organizations, governmental agencies, and the regional workforce board to help 16-to-21-year-old high school dropouts turn their lives around.

Pathways provides a year-round experience that includes two semesters of instruction and life/personal skills development and supervised summer internships, employment, and/or academic instruction (remediation). Participating students are given a structured, supportive instructional environment that assists them in completing high school, enrolling in postsecondary education and training, and being placed in high-wage, high-demand jobs.

Results
Over 100 high school dropouts have graduated from Pathways and earned postsecondary credits or credentials. Pathways has achieved SACS accreditation and was recently awarded a ten-year contract with the local school board to continue its operations, the longest contract awarded to a charter high school in Duval County.

In three years Pathways has achieved the following: *dual enrollment success (C grade or better):* 2006–2007: 39%; 2007–2008: 67%; 2008–2009: 71%; *graduation (including GED):* 2006–2007: 15 students; 2007–2008: 41 students;

> "Pathways has changed my life because I met a lot of good people! Especially, my case manager and my mentor who have been so supportive of me. I'm not used to that. Pathways has also helped the students build a network with people in our career area, helped us be prepared for college level work and is behind us to make sure we are successful."
>
> *–Pathways graduate, 2008*

Business Engagement

The school has an advisory committee made up of business partners, college staff, parents, community and governmental agencies. Partner companies also provide job shadowing and/or tour experiences, equipment, speakers, authentic learning activities, and curriculum consultation.

2008–2009: 69 students; *postsecondary transition:* 2006–2007: 6%; 2007–2008: 8%; 2008–2009: 31%; *job placement/internships:* 70% of graduates are employed.

All feedback has been extremely positive. Some students, for example, have earned A+ and Cisco certifications and gotten jobs in IT while others have been placed in carpentry and other construction areas or have transitioned to apprenticeship programs. All partnering employers have expressed enthusiastic appreciation for the skill levels and workplace readiness of graduates. Faculty at Florida State College at Jacksonville also report that their Pathways students are serious and prepared for additional and more rigorous college instruction.

Lessons Learned

Programs of this complexity—involving features and challenges such as large enrollments, extensive work-based learning and internships, authentic learning, case management, and collaboration between postsecondary educators and employers—should be phased in rather than implemented entirely in the first year.

Staff selection can also present significant challenges. The timing of teacher and staff recruitment is vital. Also, be sure you have a well-thought-out means of determining whether teaching candidates have the right skills. The most critical element of any instructional program of this type is having the right teachers and staff to build positive and lasting relationships with the students and external stakeholders.

Funding

As a public charter high school, Pathways is partially funded through FTE funding from the Duval County Public Schools. Additional funding includes grants received from Jobs for Florida's Graduates and Florida's Charter School Start Up fund (including $96,000 awarded after start-up), a one-time legislative appropriation, Career Academy grants, a U.S. Department of Labor (USDOL) Jobs for America's Graduates multi-million-dollar grant, and donations to the college's foundation.

Numerous individuals, entities, and agencies have provided financial support. The college provided $1 million to renovate a section of the campus for Pathways classrooms and offices. The college also provided funding for consultants, advisers, and focus groups and wrote successful grant applications for IT and automotive programs. A summer camp grant was funded via stimulus dollars from WorkSource to hire 60 Pathways students to learn about creating a green environment and work on the campus. For the last two years, Pathways has received a $105,000 grant from Jobs for Florida's Graduates to provide career specialists. The Florida legislature provided a one-time $500,000 appropriation to implement an out-of-school youth pilot project. Finally, former Florida State College District Board of Trustees member Michael Mass and his wife Marilyn created an endowment to fund teacher development and leadership.

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PATHWAYS ACADEMY
A DIVISION OF FLORIDA STATE COLLEGE AT JACKSONVILLE

Career Pathways Checklist

Use this checklist to examine your partnership. It will likely take more than one person to answer all the questions.

Suggestion: Review the checklist as an activity at a partnership advisory board or steering committee meeting. After reviewing, create an action plan to address any areas that need improving.

The Partnership

Yes	No	
___	___	Does the partnership have a shared vision and decision-making process?
___	___	Are all stakeholders represented (secondary & postsecondary educators; business & industry; economic development groups; community-based organizations; faith-based organizations, etc)?
___	___	Are there written agreements (charter or by-laws) that outline the basic elements of the partnership?

Choosing Pathways

Yes	No	
___	___	Has an inventory/survey of the economic development and labor market needs of the community been conducted?
___	___	Does the pathway provide employment opportunities for high-wage and/or high-demand careers?
___	___	Have programs already in place been identified?
___	___	Have the multiple exit points for each career pathway been identified?

The What – Curriculum

Yes	No	
___	___	Does the state have a blank template form indicating required curriculum elements?
___	___	Has the curriculum been built upon standards (academic, technical skills, employability, national, state and/or industry credentials) in a chosen career pathway?
___	___	Does the curriculum meet both high school standardized testing and exit requirements and postsecondary entry and placement requirements?
___	___	Are there other school/college districts in the state that are implementing the same pathway? (If so, consider researching the standards together – avoiding duplication of work.)
___	___	Have local businesses reviewed/revised the standards for local conditions?
___	___	Are there overlaps or gaps when comparing standards to existing courses?
___	___	Does the curriculum plan provide opportunities to earn college credit through dual/concurrent enrollment or articulation agreements?
___	___	Will outside assistance be needed in researching the standards and doing comparisons?

Secondary and Postsecondary Connections

Yes	No	
___	___	Are there opportunities for vertical teaming (high school with college) for educators in a particular pathway?
___	___	Are strategies in place to ensure a smooth transition from high school to college?
___	___	Is there an opportunity for dual credit? (*i.e., pushing college curriculum down to the senior year when it is applicable*)?
___	___	Is information being shared between high schools and colleges (*i.e., rate of academic remediation needed by high school graduates when entering college; placement rates of recent high school graduates at the college*)?

The How – Teaching And Learning

Yes	No	
___	___	Is teaching done contextually (in the context of how information is used in the real world)?
___	___	Have CTE instructors been provided training so that academics are being supported and stressed in CTE courses?
___	___	Have academic instructors been provided training so that academic courses are being applied to the world of work?
___	___	Are employers providing work-based learning experiences in the classroom and in the workplace for students and teachers?

Focusing Students

Yes	No	
___	___	Is there a progressive career development system (elementary through college and adult)?
___	___	Are there individual career plans at the high school level?
___	___	Do counselors have intensive professional development that includes connections with business/industry and current labor market and economic development data?

Business/Industry Role

Yes	No	
___	___	Have existing partnerships between education and business/industry been reviewed and improved to fit into a career pathways system?
___	___	Has duplication of effort been reduced by merging overlapping existing advisory committees?
___	___	Are national or state standards available for the chosen pathway(s)? Are industry standards available from an industry credentialing organization?
___	___	Have local employers reviewed and revised the national/state standards to fit the local situation?
___	___	Will businesses provide work-based learning experiences? Mentoring? Job-shadowing?
___	___	Are there opportunities for businesses to provide funding, equipment, or other resources?

The Community At-Large

Yes	No	
___	___	Is there a community awareness campaign or plan to inform the community of the changes needed in educational systems and the career pathways solution?
___	___	Has the community been informed about the changes in the schools?
___	___	Have parents been informed of the opportunities available through career pathways?
___	___	Are parents involved in career planning?
___	___	Are there other roles for parents? The community?
___	___	Have existing avenues for disseminating career pathways information been identified?

Professional Development

Yes	No	
___	___	Is targeted professional development provided for faculty, administrators, and counselors to improve teaching/learning and integration of technical and academic instruction?
___	___	Are there workshops or in-service programs already scheduled that could absorb and expand to disseminate information about career pathways?
___	___	Have opportunities for additional professional development been identified for faculty, counselors, and administrators?

Evaluation

Yes	No	
___	___	Does the partnership draw upon education data (secondary & postsecondary), labor market trends, economic and community data for planning purposes?
___	___	Have the types of data currently being collected been identified?
___	___	Have additional types of needed data been identified with a plan for collection?
___	___	Is there a plan to recognize success?
___	___	Is the data being used for planning and decision-making?

Adult Career Pathways Only

Yes	No	
___	___	Have all the components in an adult career pathways (ACP) system (Personal Needs; Academic Skills; Career Focus; Employability Skills; Career & Technical Skills; Job Entry Skills; and Advanced Skills) been defined?
___	___	Have current services been aligned with the components of the new ACP system?
___	___	Are stackable certificates available in each career pathway?
___	___	Have potential providers and partners been identified?
___	___	Has a proposed cost strategy for implementation been identified?
___	___	Has each community business sector been engaged at the CEO level to determine short-term and long-range workforce needs?
___	___	Within each career pathway, have logical points been identified for student/worker reward or reinforcement?
___	___	Has industry in each career pathway agreed to a part-time to full-time work transition plan?
___	___	Has industry in each career pathway agreed to provide for lifelong learning opportunities for their employees?
___	___	Has a gap analysis been conducted to determine the student support services necessary to enhance student success?
___	___	Has a plan been developed to add student support services that are lacking (*i.e., child care, transportation, tuition assistance, rent assistance, book fees, basic living costs*)?
___	___	Have all stakeholders in the community been engaged in the planning (*i.e., the Workforce Investment Board, government, social services, and faith-based organizations*)?

Glossary

Career Pathway—A career pathway is a coherent sequence of rigorous academic and career courses that begins in high school and leads to an associate degree, a bachelor's degree and beyond, and/or an industry-recognized certificate or license. Career pathways are developed, implemented, and maintained by partnerships involving educators, community leaders, and employers. (Often a synonym for *program of study*.) In addition, an **Adult Career Pathway** (ACP) consists of the guidance, remediation, curricula, and other support elements required to enable career-limited adults to enter the workforce and progress in rewarding careers.

Career Cluster—States may develop and implement career and technical programs of study in one or more of 16 career clusters that are recognized by the U.S. Department of Education (see box lower right and http://careerclusters.org/). The 16 career clusters are occupational categories with industry-validated knowledge and skills statements that define what students need to know and be able to do in order to realize success in a chosen field. Within each of the clusters, programs of study (also known as career pathways) have been developed, which outline sequences of academic, career, and technical courses and training that begin as early as ninth grade and lead to progressively higher levels of education and higher-skilled positions in specific industries or occupational sectors.

Career Academies—Operating as schools within schools, career academies are small learning communities which are organized around such themes as health, business and finance, computer technology, and the like. Academy students take classes together, remain with the same group of teachers over time, follow a curriculum that includes both academic and career-oriented courses, and participate in work internships and other career-related experiences outside the classroom. Over time, improving the rigor of academic and career-related curricula has become an increasingly prominent part of the career academies agenda.

Carl D. Perkins Career and Technical Education Improvement Act of 2006 ("Perkins Act")—Federal legislation which has as its purpose to develop more fully the academic and career and technical skills of secondary education students and postsecondary education students who elect to enroll in career and technical education programs.

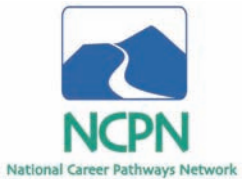
CTE—The term "career and technical education" means organized education activities that offer a sequence of courses that provides individuals with coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education and careers in current or emerging professions; provides technical skill proficiency, an industry-recognized credential, a certificate, or an associate degree; and may include prerequisite courses (other than a remedial course); and include competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, technical skills, occupation-specific skills, and knowledge of all aspects of an industry, including entrepreneurship, of an individual.

Programs of Study—Often synonymous with *career pathways*, programs of study incorporate secondary and postsecondary education elements; include coherent and rigorous content aligned with challenging academic standards and relevant career and technical content in a coordinated, non-duplicative progression of courses; may include the opportunity for dual or concurrent enrollment programs; and lead to an industry-recognized credential or certificate at the postsecondary level, or an associate or baccalaureate degree.

Tech Prep—*The Perkins Act* requires that Tech Prep programs be carried out under an articulation agreement between the participants of a consortium, typically a school district and neighboring community college. Tech Prep consists of a program of study that a) combines a minimum of two years of secondary education with a minimum of two years of postsecondary education in a nonduplicative, sequential course of study; or b) includes an apprenticeship program of not less than two years following secondary education instruction. Tech Prep programs must integrate academic and career and technical education instruction, and utilize work-based and worksite learning experiences where appropriate and available; provide technical preparation in a career field, including high skill, high wage, or high demand occupations; build student competence in technical skills and in core academic subjects through applied, contextual, and integrated instruction, in a coherent sequence of courses; lead to technical skill proficiency, an industry recognized credential, a certificate, or a degree, in a specific career field; lead to placement in high skill or high wage employment, or to further education; and utilize career and technical education programs of study, to the extent practicable.

The 16 Career Clusters

Agriculture, Food, and Natural Resources
Architecture and Construction
Arts, A/V Technology and Communications
Business Management and Administration
Education and Training
Finance
Government and Public Administration
Health Science
Hospitality and Tourism
Human Services
Information Technology
Law, Public Safety, Corrections and Security
Manufacturing
Marketing
Science, Technology, Engineering and Mathematics
Transportation, Distribution and Logistics



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