

A 2020 VISION

FOR PUBLIC EDUCATION in ULSTER COUNTY

**“Career Readiness”
for High School Graduates
in Ulster County**

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The Benjamin Center, SUNY New Paltz

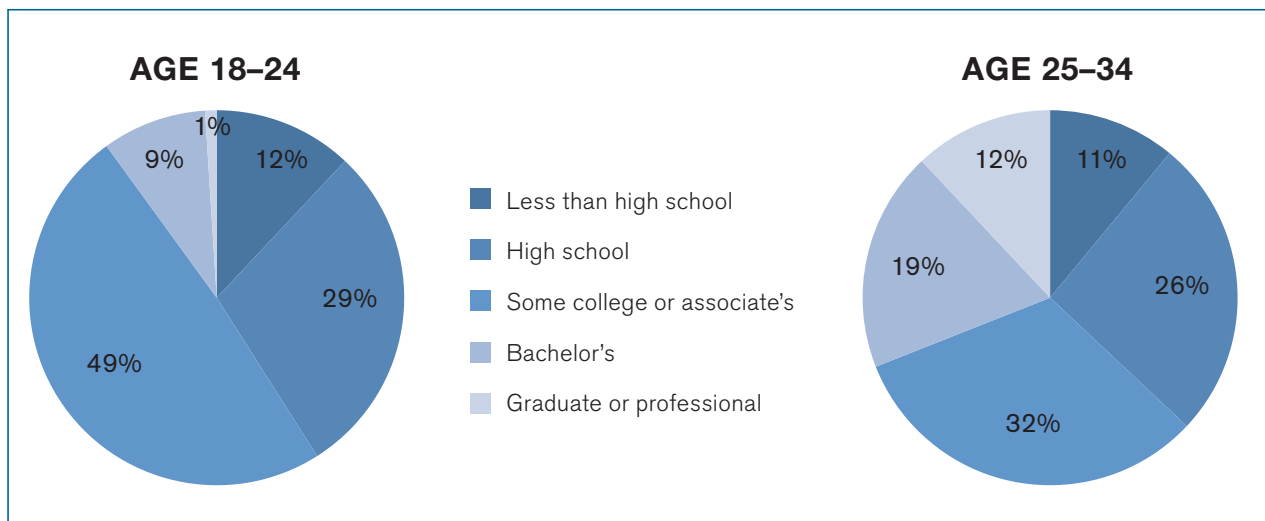
Ulster County School Boards Association

“Career Readiness” for High School Graduates in Ulster County

INTRODUCTION

Each year, about 1,700 students graduate from Ulster County’s high schools (Mid-Hudson Valley Community Profiles, 2014). Of these, about one in every ten have no interest in going to college. Others will need to work part- or even full-time while in school to help pay their bills. Still others give college a try, but soon find that it is not for them, at least not immediately. In all, a high school diploma is the terminal educational degree for 26 percent of Ulster County residents (Figure 1).

Figure 1: 2014 Educational attainment in Ulster County, ages 18-24 and 25-34



Source: U.S. Census American Community Survey, 2010-2014 5-Year Estimates



Employers across the country claim that the United States is experiencing a skills gap.

For those who want to go right to work, or must work while in school, what are the employment options? There is military service, a traditional path for recent high school graduates; 3 percent of Ulster County high school graduates plan to enter the military (Mid-Hudson Valley Community Profiles, 2014). Within the region, there are the standard low-skill entry-level jobs, e.g., fast food workers, retail sales, but these rarely lead to careers.

But there is also good news for those who wish to stay near home. Through visits to job fairs, in-depth interviews with educators, local business people, and industry and economic development professionals, and review of data from state and federal sources, we learned of career potential for high school graduates in the Hudson Valley. There are entry-level jobs for high school graduates leading to careers in advanced manufacturing (technical side and financial side), cloud computing/data entry, cyber security, biotech, banking, health care, physical/occupational therapy, pharmaceutical, transportation, warehouse storage and distribution, call center and customer services, hospitality, retail, and supervisory roles in non-retail sales, construction trades and extraction, and mechanics, installation, and repair.¹

However, in a survey conducted by the Hudson Valley's Council of Industry, the majority of responding manufacturing firms reported having difficulty hiring for open positions due to a lack of qualified candidates (King, 2014). This issue is not unique to Ulster County or to the Hudson Valley. Employers across the country claim that the United States is experiencing a skills gap (Organization for Economic Co-operation and Development, 2013). This is part of the reason that producing graduates who are both "college and career ready" was made a primary goal for public high schools in the federal

government's Race to the Top reforms, and persists as an expectation in the recently passed national Every Student Succeeds Act (ESSA).

The educational goal of preparing youth for the world of work is not new. This has been a long-standing objective of public education, and high schools specifically (see Commission on the Reorganization of Secondary Education, Cardinal Principles of Secondary Education, 1918). To cite one example, one of the original goals of BOCES was to offer vocational training and economic development support for rural areas (Benjamin & Nathan, 2001), a mission that is implemented through vibrant career and technical education programs even today. There have been persistent challenges in meeting this goal. Curriculum, staff, and training equipment must keep pace with a quickly changing work environment; it has been difficult for schools to respond quickly to these external forces. Thus, "career readiness" is a current manifestation of a long-time focus of educational institutions.

In this paper, which is the sixth in a series released by The Benjamin Center's *A 2020 Vision for Public Education in Ulster County* initiative, we explore how Ulster County school districts are acting to meet the goal of producing career ready high school graduates. To do this we examine the meaning of "career readiness," present data on the employment market in Ulster County and the Hudson Valley, and try to get behind the "skills gap" that employers bemoan. Then we highlight some of the exciting initiatives that school districts in Ulster County have developed to respond to this challenge. For this work, we interviewed several employers across the Hudson Valley, as well as staff in agencies that focus on workforce development. Local school districts and Ulster BOCES provided information about current programs.

CAREER READINESS: DEFINITIONAL AMBIGUITY

Despite the national push to ensure that high school graduates are ready to enter the workforce, there is no standard national definition of career-readiness. Some consensus on three key domains of career readiness emerges, however, from definitions developed by interested national organizations that focus on the inputs and skills necessary for success in the workplace. They are; 1) core academic skills and the ability to apply those skills to concrete situations in the workplace; 2) employability skills, such as critical thinking, responsibility, timeliness; and 3) technical skills related to a specific career pathway (Association for Career and Technical Education, Career Readiness Partner Council, Achieve, Center on Education Policy).

Within this general frame, definitions differ slightly. For example, according to the Career Readiness Partner Council:

A career-ready person effectively navigates pathways that connect education and employment to achieve a fulfilling, financially-secure and successful career. A career is more than just a job. Career readiness has no defined endpoint. To be career ready in our ever-changing global economy requires adaptability and a commitment to lifelong learning, along with mastery of key knowledge, skills and dispositions that vary from one career to another and change over time as a person progresses along a developmental continuum. Knowledge, skills and dispositions that are inter-dependent and mutually reinforcing include:

- **Academic and Technical Knowledge and Skills:** A career-ready person is proficient in the core academic subjects, as well as in technical topics. This foundational knowledge base includes competence in a broad range of academic subjects grounded in rigorous internationally benchmarked state standards—such as the Common Core State Standards for English language arts and mathematics. It also includes a level of technical-skill

proficiency aligned to a chosen career field and pathway, and the ability to apply both academic and technical learning in the context of a career. Many careers also require deeper learning and mastery in specific academic or technical subjects.

- **Employability Knowledge, Skills, and Dispositions:** A career-ready person has a good understanding of their interests, talents and weaknesses and a solid grasp of the skills and dispositions necessary for engaging in today's fast-paced, global economy. These include, but are not limited to: goal setting and planning; managing transitions from school to work and back again, and from one occupation along a career pathway to another; clear and effective communication skills; critical thinking and problem solving; working productively in teams and independently; effective use of technology; and ethical decision-making and social responsibility.

Further, there has been a focus on defining technical skills associated with different careers. Through the National Career Clusters Initiative, business and industry leaders have identified knowledge and skill necessary for success across 16 industries (e.g. Information Technology or Architecture and Construction). Skills are then further identified for more specific career pathways within those industries (e.g., the network systems pathway within the field of Information Technology or the maintenance/operations pathway within the field of Architecture and Construction). Clusters identify broad, overarching skills necessary for success, while pathways focus on more specific academic and technical skills required by the field (see www.careertech.org/career-clusters).

The federal government and state departments of education are inclined to say that career readiness requires many of the same skills as college readiness. Thus, in most states, college and career readiness are

defined concurrently (National High School Center, 2012; Mishkind, 2014, National Forum on Education Statistics, 2015):

National Forum on Education Statistics (a data arm of the National Center for Education Statistics): A student is college and career ready when he or she has attained the knowledge, skills, and disposition needed to succeed in credit-bearing (non-remedial) postsecondary coursework or a workforce training program in order to earn the credentials necessary to qualify for a meaningful career aligned to his or her goals and offering a competitive salary (National Forum on Education Statistics, 2015, p. 1).

Missouri: College and career readiness means that a high school graduate has the necessary English and mathematics knowledge and skills—including, but not limited to, reading, writing, communications, teamwork, critical thinking and problem solving—either to qualify for and succeed in entry-level, credit bearing two- or four-year college courses without the need for remedial coursework, or in workforce training programs for his/her chosen career that offer competitive, livable salaries above the poverty line, offer opportunities for career advancement, and are in a growing or sustainable industry.

Some bemoan this integration. In a survey of states, Achieve and the National Association of State Directors of Career Technical Education Consortium (NASDCTEC) report that many states conflate college and career readiness, to a point where career readiness is applicable only to a small group of – primarily – nonacademic students. “The story seems to be that the essential “and” in “college and careers” is actually an “or,” with the focus on career readiness often limited to a subset of students” (Achieve, 2014, p. 3; see also McCurrer et al., 2013). Moreover, there is some concern, at the national level, that the pressure to create career-ready programming has resulted in “ad hoc” implementation, rather than the development of coherent, systemic career-readiness plans. According to the College and Career Readiness and Success Center (CCRSC), which is funded by the US Department of Education, “the increased focus on college and career readiness, combined with the complexity of the challenges associated with the

topic, have led to a rapidly expanding college and career readiness community, rich with resources yet replete with confusion” (CCRSC, 2014; see also NFES, 2015, p. 23). Nevertheless, state definitions of career (and college) readiness seem to converge around five common categories of “knowledge, skills, and dispositions:” academic knowledge (most often English and math); critical thinking and/or problem solving; social and emotional learning, collaboration, and/or communication; grit/resilience/perseverance; citizenship and/or community involvement (Mishkind, 2014, p. 3-5).

Career readiness has no defined endpoint. To be career ready in our ever-changing global economy requires adaptability and a commitment to lifelong learning, along with mastery of key knowledge, skills and dispositions that vary from one career to another and change over time as a person progresses along a developmental continuum.

There is also inconsistency in the measurement of career readiness, as currently, there is no standard measure (Gewertz, 2015; National Forum on Education Statistics, 2015; McMurrer et al., 2013). Nevertheless, there are assessments that are commonly employed. ACT’s WorkKeys is a series of assessments that gauge foundational academic as well as employability skills; additional assessments are tailored to a few, specific industries. Those who successfully complete a WorkKeys assessment sequence qualify for the ACT National Career Readiness Certificate. The Armed Services Vocational Aptitude Battery (ASVAB), administered by the United States Military Entry Processing Command, measures aptitude in multiple areas, including mathematics, verbal expression, word knowledge, arithmetic reasoning and general science. The National Occupational Competency Testing Institute (NOCTI) administers exams that assesses technical competencies for various occupations as well

as “Pathway Assessments” that are aligned with some of the pathways identified through the National Career Clusters Initiative. SkillsUSA Work Force Ready System administers industry-specific assessments in a variety of fields (www.act.org/products/workforce-act-workkeys/; National Forum on Education Statistics, 2015 in your bookmarks; also McMurrer et al., 2013).

Although New York State has not developed a definition of career-readiness (National Forum on Education Statistics, 2015; Mishkind, 2014), it has adopted career-ready standards that fall within three major domains: ²

- **Core academic knowledge and skills**
Rigorous academic knowledge and skill in all core academic areas, but especially math and English Language Arts
- **Key behaviors and attitudes**
Non-cognitive, social-emotional knowledge and skills that help students successfully transition from high school to college or careers. These include resiliency, responsibility, persistence, determination, and skills such as time management, communication, collaboration, goal setting, and problem-solving.
- **Career-specific knowledge and skills**
Career-specific opportunities for students to gain the knowledge, skills, and competencies that are

applicable in a particular field. Career-specific skills may include technical skills for a trade or manufacturing career or academic skills for careers in business, teaching, medicine or law. (NYS Education Department, 2013, 2014, 2015).

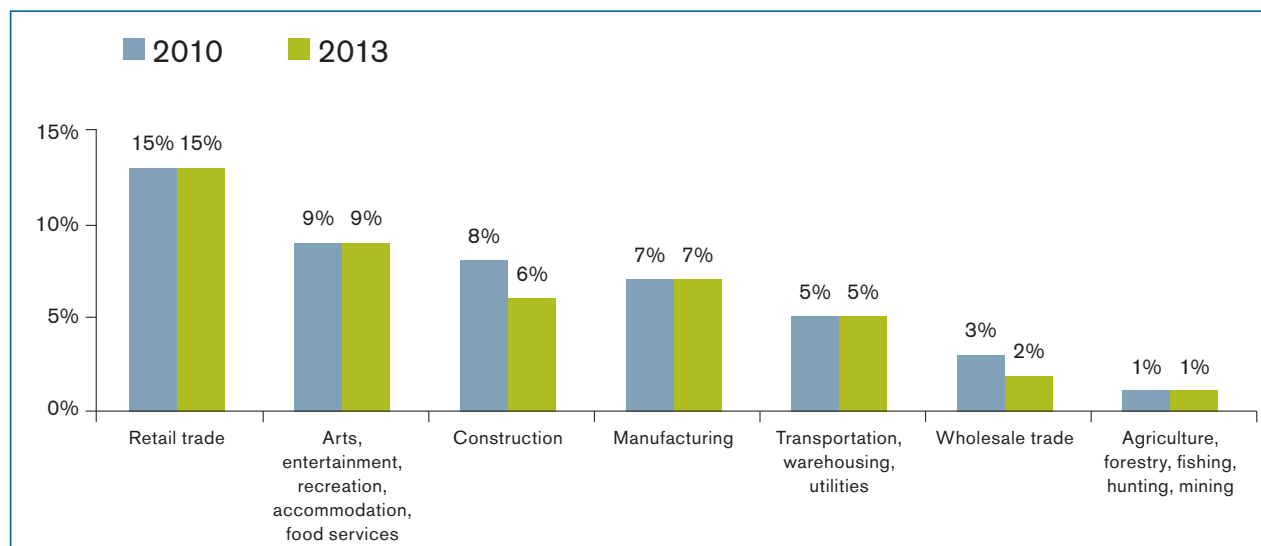
In New York, career readiness, alone, is not assessed in any systematic way; the New York State Education Department has designated a “college and career ready” benchmark for the grades 3-8 NYS English Language Arts and math standardized tests, but this emphasizes the first domain of the career-ready standards stated above (core academic knowledge and skills) and not the other two. BOCES programs across the state use a variety of assessments to measure outcomes of students who attend their Career and Technical Education (CTE) programs. Recently, the state Education Department has proposed a new graduation pathway that includes a focus on careers. This Career Development and Occupational Studies (CDOS) pathway would allow students to earn a diploma after passing four Regents exams (one in math, English, science, and social studies) and fulfilling the requirements for the CDOS credential, which includes CTE coursework or work-based learning experience, an employability profile that documents the student’s specific skills, and the development of a career plan.³



JOBS IN THE HUDSON VALLEY: WHAT'S OUT THERE?

Figure 2 depicts the seven sectors in Ulster County identified as having a high probability of employment for high school graduates; overall, these sectors represent 40 percent of employees in the county. Retail and hospitality comprise about one in five of these existing jobs; six other sectors combine to comprise the others.

Figure 2: Ulster County employment sectors with probability of opportunity for high school graduates: percentage of total employment, 2010 and 2013



Source: U.S. Census American Community Survey

Occupations: What Type and How Many Are Available?

The NYS Department of Labor (DOL) has identified over sixty job titles that require only a high school diploma or equivalent with no related job experience, and have “very favorable” or “favorable” employment prospects for growth over the next decade; Table 1 lists the 34 titles with “very favorable” forecasts. (Note that this list is for the entire Hudson Valley, and not just Ulster County.)

Table 1. Hudson Valley occupational employment with “very favorable” projections, 2012-2022, job titles only requiring/mostly held by workers with high school and no experience

JOB TITLE	2012-2022 CHANGE	AVERAGE ANNUAL GROWTH	ENTRY WAGES	ON-THE-JOB TRAINING NEEDED ⁴
Childcare Workers	1,840	180	\$20,020	Short-term
Security Guards	2,430	240	\$22,310	Short-term
Receptionists and Information Clerks	1,380	140	\$22,880	Short-term
Maintenance and Repair Workers, General	1,620	160	\$27,960	Long-term
Carpenters	1,570	160	\$41,040	Apprenticeship
Automotive Service Technicians and Mechanics	740	70	\$30,210	Long-term
Bus Drivers, School or Special Client	810	80	\$29,700	Short-term
Electricians	940	90	\$37,920	Apprenticeship
Plumbers, Pipefitters, and Steamfitters	730	70	\$46,400	Apprenticeship
Light Truck or Delivery Services Drivers	250	30	\$19,420	Short-term
Operating Engineers and Other Construction Equipment Operators	300	30	\$44,210	Moderate-term
Inspectors, Testers, Sorters, Samplers, Weighers	200	20	\$22,470	Moderate-term
Lifeguards, Ski Patrol, and Other Recreational	140	10	\$19,290	Short-term
Bus Drivers, Transit and Intercity	240	20	\$26,340	Moderate-term
Automotive Body and Related Repairers	210	20	\$26,770	Moderate-term
Industrial Machinery Mechanics	190	20	\$41,560	Long-term
Payroll and Timekeeping Clerks	190	20	\$32,430	Moderate-term
Machinists	150	20	\$22,100	Long-term
Structural Iron and Steel Workers	140	20	\$45,260	Apprenticeship
Brickmasons and Blockmasons	180	20	\$52,740	Apprenticeship
Food Batchmakers	120	10	\$19,350	Moderate-term
Assemblers and Fabricators, All Other	140	10	\$21,030	Moderate-term
Helpers—Electricians	100	10	\$22,590	Short-term
Production Workers, All Other	70	10	\$21,580	Moderate-term
Concierges	50	10	\$26,570	Moderate-term
Paving, Surfacing, Tamping Equipment Operators	100	10	\$27,020	Moderate-term
Stonemasons	80	10	\$28,800	Apprenticeship

JOB TITLE	2012-2022 CHANGE	AVERAGE ANNUAL GROWTH	ENTRY WAGES	ON-THE-JOB TRAINING NEEDED ⁴
Reinforcing Iron and Rebar Workers	60	10	\$79,930	Apprenticeship
Maintenance Workers, Machinery	60	10	n/a	Moderate-term
Computer-Controlled Machine Tool Operators, Metal and Plastic	50	n/a	\$25,220	Moderate-term
Animal Trainers	30	n/a	\$22,310	Moderate-term
Locker Room, Coatroom, Room Attendants	30	n/a	\$20,270	Short-term
Welding, Soldering, and Brazing Machine Setters, Operators, and Tenders	40	n/a	\$27,150	Moderate-term
Food Cooking Machine Operators and Tenders	30	n/a	\$21,680	Moderate-term

The Department of Labor projects that we can expect over 15,000 job openings for high school-only graduates in the Hudson Valley, through 2022; an average of about 1,500 jobs per year. Not surprisingly, the pay is generally low: the median entry level wage is \$26,570 – compared with \$43,000 for “middle skills” jobs that require some level of post-secondary education or training prior to employment. But some of these jobs pay very well (see also Achieve, 2012). The amount of requisite on-the-job training varies: 23 percent require short-term training, 44 percent require moderate-term training, 12 percent require long-term training, and 21 percent involve apprenticeships.

Some workforce organizations have categorized these occupations into three hierarchal skills categories: low, moderate, and high. Low-skill jobs include reception, housekeeping, security, or maintenance and cleaning services. Research suggests that “students with a high school diploma (or less) and no additional education and training are by and large eligible only for “low skills” jobs, which offer limited career and earning prospects over a lifetime” (Achieve, 2012a, p. 3).

Moderate skill level occupations are typically entry level with some advancement possible, such as call center operators, bank tellers, payroll clerks, grocery clerks, or shelf stockers, warehousing (inventory control, shipping, and receiving), and some lower level manufacturing positions. Advancement in these fields often requires additional training or an

associates’ degree. These positions may be open to high school graduates with no additional education or training, and in some instances, employers support the further education and /or training employees need for advancement in these fields (see also Achieve 2012, 2012a).

Higher skill occupations seek employees with specific skills and training capabilities from the start; dental assistants, medical assistant, surgical technicians, and many manufacturing positions are in this category. Here again, employers were sometimes willing to provide, or pay for, additional training to candidates initially prepared in high school.

One well-known avenue to a high skill job with only a high school education is apprenticeship. Apprenticeships are common in the trades, for example, for jobs as carpenters, plumbers, mechanics, and electricians. Apprentices get a well-paying job and training in a specific occupation. They embark upon a career that opens up the possibility for additional education and results in a nationally recognized “Certificate of Completion” from the NYS Department of Labor (NYS Department of Labor, 2015a). However, we often heard from employers that apprenticeship programs are not very accessible; competition is fierce, and the screening process credits experience in the field. Thus, in most cases, a high school graduate without a few years of relevant experience is not a viable candidate.

THE SKILLS GAP



In a 2013 survey of Hudson Valley companies, the Council of Industry reported that “close to 60 percent of respondents said that they were having difficulty hiring for open positions and over 70 percent ... [were] unable to fill one or more positions for more than three months due to lack of qualified candidates” (King, 2013, p. 10).

Overall, employers and workforce professionals in the region discuss the skills gap in three substantive categories: “employability,” academic, and technical. Within these, what competencies do they think job seekers are lacking?

“Employability skills,” also termed soft skills, include: timeliness; reliability; capacity for civil, effective interpersonal interaction with supervisors, coworkers, and the public; ability to take and follow directions; the capacity to work both independently and with a team; and, importantly, the awareness of and willingness to “turn off the cell phone.” Others add “applied skills” to the employability list, such as critical thinking and problem-solving – essentially, the ability to apply knowledge to a workplace context. In a survey of over 400 businesses and corporations nationwide, researchers found that employability or applied skills,

“trump basic knowledge and skills, such as reading comprehension and mathematics” in importance to success at work (Casner-Lotto, 2006, p. 9). To assess these skills, one employer uses a screening test with a variety of simulated situations to determine how potential workers will act and react in workplace scenarios.

Relatedly, several employers mentioned thoroughness and “attention to detail” as a critical missing entry-level worker capacity. This can range from writing up safety notes in manufacturing, inventorying fresh and stale products when stocking shelves, and using correct formats and specification on banking forms. In the execution of these jobs, one employer noted, “65 percent accuracy is not good enough.” Even a janitorial firm mentioned attention to detail as essential to assuring that everything gets properly cleaned.

Lastly with regard to employability, for positions where physical labor is required (stocking shelves, for example), employers mentioned trouble finding candidates who are healthy and fit enough to execute tasks like standing for hours, climbing stairs, and lifting heavy items.

Academic knowledge involves a solid foundation of skills in English Language Arts (informational reading, writing skills, oral presentation skills), and mathematics. Employers state that they need people who can read procedural manuals – and then follow their directions. And they need people who can accurately and completely write down and verbally report outcomes and needed next steps, for example regarding a customer service call. With regard to math, employers seek graduates with command of basic math skills (including algebra) and the ability to *apply* these math skills in a work-based context.

One employer described the need to call upon geometry and an understanding of spatial relationships learned in school to determine packaging for a customer order with multiple parts and shapes. Other math skills are needed to accurately log inventory or treatment information or to track incidents. Trades like carpentry and plumbing regularly utilize applied algebra. There are also logic requirements, which can be applied in basic computer programming. One employer at a job fair maintained that if a person comes with a solid high school background in science, “I can train someone who knows what a circuit is and understands that different materials have different properties.”

Technical skills are industry-based and often specific to a particular career; training in these areas is most often obtained through internships or apprenticeships. One overarching technical skill – proficiency and comfort with computers – is now often taught in schools. This important skill was emphasized by interviewees in multiple contexts, particularly regarding proficiency with an office application suite and some business applications. We were also told by employers that there is a common misperception that “using a browser to access information or being able to use a smart phone are not computer skills” (see also NYCTE, 2012).

Businesses and corporations across all industries anticipate that future jobs – at all levels – will require more skills, education and credentials (or certifications) than currently, though to varying degrees. “The percentage of jobs that will have no minimum education requirements or require only a high school diploma or equivalent will decrease in the future . . . The data suggest that employers’ demand for higher levels of education will continue to increase in coming years, particularly in those middle skills jobs that may have previously been accessible with only a high school diploma” (Achieve, 2012, p. 4).



SCHOOL DISTRICTS RESPOND

Ulster County school districts have been paying attention. They know that employers are asking for schools to teach English and math in a way that makes knowledge transferable to the workplace. In an environment of such fast-paced change, this often means teaching students to apply their knowledge and to be prepared for further training. Thus, in addition to incorporating “career awareness” into required classes at the middle and high school level and helping students craft “college and career” plans, many school districts in Ulster County are developing courses, or course sequences, that introduce students to particular industries or fields. Moreover, many courses are now incorporating instructional strategies designed to develop students’ critical thinking, problem-solving, and collaboration skills; the very “employability” skills that employers seek. For more specific career-prep, school districts can turn to Ulster BOCES’ Career and Technical Center, which is open to high school students in Ulster County and offers courses in a range of fields. Below we feature one such career-oriented program from each Ulster County school district, and BOCES; some of these target a college-bound population, while others target students with plans to enter the workforce directly after graduation. Again, we feature only one example from each district, although there are many more.⁵

Ellenville Central School District

Ellenville Central School District offers a series of classes in graphic arts and design that prepare students for employment in various design-based fields, including book design and publishing, advertising, magazine layout, motion graphics, animation, and web design. Courses in this series include: *Studio in Graphic Arts*, in which students learn to apply knowledge of art elements and principles of design to strengthen their visual literacy. Students work on projects ranging from logo design to book art using a variety of media and software programs and are expected to complete written, visual, and research-based digital journal assignments. *Graphic Design*, the second course in the series, emphasizes the development of technical,

reasoning, analytical, and problem-solving abilities. Students develop skills in design, advertising, and illustration and then apply these skills to the creation and production of school-related promotional materials.

Highland Central School District

Presentational Speaking is a 3 credit elective offered at Highland High School through the State University of New York at Ulster. It is open to all Highland High School students. Students learn and practice the fundamentals necessary to become polished public speakers and skilled rhetoricians. Through a series of informal speeches, presentations, activities, readings, and viewings, students prepare for four major speeches that are a prerequisite for course completion. Students also analyze and discuss Ted Talks and exemplary speeches in a number of different styles for a variety of audiences. In addition to the required speeches, students engage in listening and speaking exercises in formal and informal settings.

Kingston City School District

The Kingston City School District and Alcoa, a worldwide manufacturing company located within the city of Kingston, collaborated to develop a curriculum sequence that equips Kingston High School students with the knowledge and experience to pursue high-tech manufacturing as a career, or to further their education in the field through post-secondary education. Six courses are included in this sequence; three are described here. In *Sales and Marketing*, students learn the foundations of marketing, product integration, developing target markets, and aligning customer needs with appropriate products/services. Emerging technologies, such as social media marketing techniques, are used in the creation of projects for this course. In *21st Century Principles for Management Theory*, students learn about the American business system and its role in the greater global economy, explore different management and leadership strategies, and study the interconnections among

industry, government, and the global economy. In *Engineering Design, Development, and Problem Solving*, students work in teams to develop an original solution to a valid open-ended technical problem by applying the engineering design process. Students use Technical Drawing and Computer Aided Design programs (C.A.D.) to design their solutions.



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New Paltz Central School District

A series of Media Arts and Technology electives employ a project-based learning approach to help students become proficient in a variety of new media software. These elective courses provide students with insight into, and experience with, emerging technologies in design and media. Participation in these courses also provides students with opportunities to develop skills in critical thinking, creativity, communication, and presentation. These electives are offered in addition to the series of courses in science, technology, and engineering that are part of Project Lead the Way. Media Arts and Technology electives include: *Digital Video Editing* and *Advanced Video Editing for Broadcast*, in which students learn the fundamentals of pre-production, production, and post production, and are able to complete video productions for presentation; *Computer Graphics*, in which students engage in a variety of media applications, and creative and technological processes including advertising design, web and print design, design for communication, three dimensional modeling and fabrication (3d printing), animation and motion graphics; and *Studio in 3d Modeling* which teaches students to build and manipulate models in a virtual 3d environment using 3d modeling software.

Onteora Central School District

Onteora Central School District offers a Robotics program that helps student’s develop necessary problem solving, computer programming, and engineering skills. Students have the opportunity to take a yearlong course in robotics that asks participants to design, build, and modify robots so that they are capable of completing a variety of different tasks and challenges. The first half of the school year is spent learning how to construct robots and use Icon-based programming platforms and the second half is dedicated to building more advanced robots and learning the text-based programming required to make these robots operational. Students are taught to work by themselves productively as well as work collaboratively as part of a team. Robotics students have the opportunity to compete in the robotics section of Science Olympiad, a tournament that challenges high schoolers from across the state to design and create robots to fulfill certain tasks and challenges.

Rondout Valley Central School District

Rondout Valley’s High School and Career Plan is a four-year process designed to help students think about, and deliberately plan for, their future. Students are required to design a plan for their high school careers with their post-secondary and career goals in mind. Students write their first plan of action in 9th grade and then revise this plan as necessary, as their interests and needs change, throughout the next four years. The High School and Career Plan works in collaboration with the district’s Program of Study. The Program of Study is designed to link classroom instruction, student guidance, career and technical student organizations, career development, and community participation for specific career types, which may or may not include post-secondary education. The objective is to help students forge a pathway that will ensure career readiness upon graduation and/or best prepare them for post-secondary studies. As with the High School and Career Plan, the Program of Study serves as a guide for a student’s high school career.



Saugerties Central School District

The Saugerties Central School District's *Saugerties GROWS* (Saugerties Graduation Requirements through Occupational Work Study) is designed to help students with disabilities earn the career development and occupational studies (CDOS) credential that NYS offers to students with special needs. This program, which is still in development, has three primary components; a greenhouse, vegetable garden, and farm stand, all to be constructed on the grounds of the high school. From there, *Saugerties GROWS* plans to integrate a variety of practical, hands-on learning experiences into an academic course of study; participating students will learn about environmental science and technology as they build the green house, grow produce within it and then sell this produce at the farm stand. They will learn about family and consumer sciences, sales, customer service, and economics as they create products with their produce

(pies, jellies, etc.) and then sell those products at the farm stand. And finally, students will be able to apply skills in art, advertising, marketing, and web design to the promotion of their products and the farm stand more generally. District officials are working with local business to ensure alignment between *Saugerties GROWS* and industry needs. Students will also engage with local farmers and agricultural businesses through workshops and presentations.

Wallkill Central School District

Wallkill Central School District's *Project Lead the Way* is a pre-engineering curriculum that helps students develop the knowledge and skills necessary for a career in engineering. Courses, which were designed in consultation with industry, teach students to apply engineering, science, math, and technology to solve complex, open-ended problems in a real-world context. Coursework emphasizes the development of skills

in collaboration, communication, critical thinking, and problem solving. The course sequence includes five courses; three are featured here: *Principles of Engineering* encourages students to explore various technology systems and manufacturing processes and also learn about the social and political consequences of technological change. *Computer Integrated Manufacturing* applies principles of robotics and automation, which students use to build actual models of their three dimensional designs. In *Engineering Design and Development*, students work in teams to research, design, and construct a solution to an identified engineering problem. Students are guided by a mentor from the community and they must write progress reports, a final report, and present their findings to an external panel of reviewers.

Ulster BOCES

Career and Technical Center (CTE)

The Ulster County BOCES Career and Technical Center offers 27 different career training programs for the students of Ulster County schools. The programs offered take one to two years to complete and cover a wide array of fields from aviation, cosmetology and CISCO networking to hospitality and custom robotic design and manufacturing. Additionally, a series of pre-university New Visions programs provides every student enrolled real-world practical internship-like experiences. Most of BOCES' CTE programs and all of its New Visions programs were designed in collaboration with local higher education institutions. The programs allow students to earn college credit during their senior year of high school while pursuing a growing field. All of these trade programs have core subject knowledge integrated into their curriculum, allowing students who do not learn well in the traditional classroom setting an opportunity to gain hands on experience and knowledge in fields that translate into careers post-graduation. Often times, classroom projects result in benefits for the greater community: fashion design students created dog clothing for the Walden Humane Society, robotics and culinary arts students worked together to create Christmas tree ornaments for children with brain cancer. Students can choose programs in business and information systems, engineering technologies, health occupations, human and public services, or trade and

industrial systems. Those who complete the program are given a distinctive technical endorsement on their Regents diploma upon graduating and many leave high school with completed college credits as well.

The Hudson Valley Pathways Academy (P-Tech)

Ulster BOCES offers the Hudson Valley Pathways Academy (P-Tech), a four-six year program for not traditionally college-bound students in Ulster, Dutchess, Orange, and Sullivan counties. P-Tech begins in the 9th grade and ends with the student earning both a high school diploma and an associates' degree. In addition to providing core courses in English and social studies, P-Tech focuses on science, technology, engineering and mathematics; associate degrees are offered in Information Technology or Advanced Manufacturing. Curricula were designed with input from local industry. The P-Tech program is grounded in a project-based learning philosophy; students engage practical challenges in the business world, develop solutions to these problems and then present their solutions to industry leaders. P-Tech works to add changes in their fields of science and technology as they emerge, incorporating fields like cyber security, for example, into the program. Finally, internship and networking opportunities are available to students.

P-Tech has partnered with five SUNY schools, four BOCES, the Council of Industry (a consortium of over 100 manufacturing and technology companies) and Mediacom (a television, internet and telecommunications company). Some local industries have agreed to give P-Tech graduates priority when hiring. Students attend P-Tech free-of-charge; tuition is paid by students' home districts.

... courses are now incorporating instructional strategies designed to develop students' critical thinking, problem-solving, and collaboration skills; the very "employability" skills that employers seek.



CONCLUSION

Preparing students to enter the workforce, or to engage in a career, is an important element and long-time goal of public schools. To advance a cohesive career-ready program, experts advocate a series of action steps: 1) the development of planning tools and data systems that help coordinate and align curriculum among offered courses, within and between school districts and, in the case of New York, with BOCES; 2) creation of a tool - sometimes referred to as an individualized learning plan, or ILP - that can help students plan, and then track progress toward, an aspired career; 3) a mechanism for obtaining feedback from industry and employers; and 4) reports on progress toward career readiness goals from each state (NFES, 2015).

We already have some of this collaboration in Ulster County. BOCES has brought some of its career-ready classes to local districts so that students do not have to travel. Several school districts worked with local businesses in the development of their programming. Continued – and even enhanced – collaboration among school districts and BOCES and with the business community to help shape the content of career-readiness programming and to provide practical, work-based experience would certainly be useful to school districts, students, and local industry. At its 2016 convening, A 2020 Vision for Public Education in Ulster County will consider the further development of such collaborations.

¹ Advancement in many of these career areas often requires additional, on-the-job training or, in some cases, an associate's degree. Nevertheless, entry-level opportunities are available for high school graduates.

² New York has adopted the Nation Career Clusters Model, which it has organized around six major areas: Arts and Humanities, Business and Information Systems, Engineering Technologies, Health Services, Human and Public Services, Natural and Agricultural Sciences (CCRS, 2014; <http://www.ccrscenter.org/ccrs-landscape/state-profile/new-york>).

³ The CDOS credential is currently available for students with special needs. In its current form, this is a credential that indicates that the holder has the skills necessary for entry-level employment. It is not a diploma.

⁴ Long-term training: more than 12 months; moderate-term training: more than 1 month and up to 12 months; short-term training: 1 month or less.

⁵ Descriptions were pulled from a variety of sources, including course catalogs and interviews with teachers, principals, and assistant superintendents.

Author Bios

Robert Curran is the current President of the Ulster County School Boards Association and a member of the Ulster BOCES Board of Education. He is a former member of the Onteora Board of Education and a retired IBM Software Engineer. Bob is a certified volunteer Medicare counselor for the Ulster County Office for the Aging, where he helps senior citizens maximize Medicare and afford their health care; he is a board member of the Ulster County United Way, where he also volunteers as a tax preparer to help low income working people prepare their taxes; and he is a volunteer with Ulster Literacy, where he works with non-native English Language speakers. He holds a BS degree from Fordham University and an MS from Brown University.

Robin Jacobowitz, PhD, is the director of education projects at the Benjamin Center for Public Policy Initiatives at SUNY New Paltz. Previously, Robin worked with Janice Hirota and Associates on an evaluation of school reform initiatives in New Orleans, Washington DC, New York City, and Dallas. She also worked at New York University's Institute for Education and Social Policy, where her research centered on the growth and development of charter schools in New York State, the organizational structures that facilitate teaching and learning in New York City small high schools, and leadership transitions in new schools in New York City. She worked with the University of Chicago's Chapin Hall Center for Children, where her research focused on the relationship between constituency building and policy work in effecting systemic school reform in New York State. Prior to beginning her career in research, Robin worked with the Public Education Network in Washington DC, where she provided technical assistance to local education funds around the country on issues of school governance, school health, and public engagement. Robin holds a MEd in education policy from the Harvard University Graduate School of Education, and a Ph.D. from the Robert F. Wagner Graduate School of Public Service at New York University. She is currently a trustee on the Kingston City School District Board of Education and serves on the executive committee of the Ulster County School Boards Association.

kt Tobin, M.S., is the associate director of The Benjamin Center at SUNY New Paltz where she is responsible for designing, conducting, managing, and producing studies on regional issues and concerns. Her recent publications include: *Mid-Hudson Municipal Use of Technology & Participation; Agriculture Supporting Communities in the Mid-Hudson Region; Communicating Student Research at SUNY New Paltz to State and Local Elected Officials; Poughkeepsie Plenty: A Community Food Assessment*; and the *Mid-Hudson Arts and Culture: the Economic Impact*. KT is also editor of the *CRREO Discussion Brief Series*. KT is the former Vice President of the New Paltz School Board and a current member of their Legislative Action committee. She has served on several regional and community committees including the Mid-Hudson Regional Sustainability Planning Consortium, the Mid-Hudson Regional Economic Development Council Metrics Committee, and in New Paltz: the Government Efficiency & Effectiveness Project, GreenWorks, Flood Aid, the Regatta, and the Wallkill River Watershed Alliance. KT is also an adjunct lecturer in Sociology, teaching Intro to Sociology, Social Inequality, and Research Methods.

Micaela Kayser is a senior at SUNY New Paltz majoring in Women's, Gender, and Sexuality Studies. She has worked with the Benjamin Center on a variety of education-related projects and has co-authored on additional Benjamin Center publications. Her work with the Benjamin Center was included in the 2015 SUNY New Paltz Research Symposium. In 2015, Micaela completed an internship at Maternal-Infant Service Network and was selected to attend the NEW Leadership New York Summer Institute, a leadership development program for college women. Upon graduating, Micaela plans to attend graduate school and would like to pursue a career in public service.

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Sources

For a complete list of works cited for this paper please reference the electronic version at www.newpaltz.edu/benjamincenter.

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