Digging Deeper

Aligning Skills, Technology and Attainment Between Industry and Education

MCCEI

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Introduction

The Maryland Center for Construction Education and Innovation (MCCEI) is a cross-sector partnership between industry, education and government with the primary mission of building a world-class education system for Maryland's construction industry.

To achieve this mission, MCCEI is working on three primary initiatives to…

1. **Change** the image of construction to attract more people to pursue careers in skilled trades and construction management.
2. **Align** industry and education to ensure the future workforce has the skills and credentials given rapidly advancing technologies and articulate programs to offer a path of least resistance to careers.
3. **Expand** Maryland's college degree offerings to educate state residents for careers in Maryland.

"The Critical Path: Positioning Maryland as an Innovation Leader in the Global Construction Industry."

The Critical Path, published in December 2012, was a forward-looking summary of opinions from 126 built environment business leaders throughout the mid-Atlantic region on the future of the business of construction from technology, workforce readiness and educational alignment standpoints. The result of *The Critical Path* was a set of policy recommendations for business, education providers and state government, which are summarized below:

1. **Expand or add** construction education programs where needed primarily focused on bachelor's degree level programs.
2. **Align** existing programs to industry needs.
3. **Strengthen** articulations between programs to create easily navigable education pathways from high school through university programs.
4. **Create** a public image building campaign to promote numerous career paths in the construction industry.
5. **Attract** other demographic groups.
6. **Help** the industry to recognize and adapt to new technologies.

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About this Report

As a follow up to *The Critical Path*, MCCEI began a series of workshops called Industry Advisory Panels (IAPs) in mid-2013. The purpose of the IAPs was to begin working on the issue of aligning education programs with future industry needs.

Data from The Critical Path told us that:

- The two avenues that needed the most investment were university level construction management programs and high school level career and technology programs; and,
- The skills, knowledge base that needed the most improvement were field experience, computer technologies including Building Information Modeling, math and science, communications, career readiness and business management.

Top Recommended Concentrations for Maryland's Education System to Best Serve the Construction Industry

MCCEI, *The Critical Path*, 2012

BIM, Design, Computer Technology	Field Experience	Math/STEM	Communications, Interpersonal Skills	11% Career Readiness; 8% Other Education; 7% Business Management		
22%	19%	17%	17%	11%	8%	7%

With the IAPs, MCCEI set out to dig deeper into these topics and find out specifically **where industry needs to better align with education programs and curriculum**. The IAPs were designed to be open forums to get industry and education talking to each other in an environment where we could all work towards a common goal of building a world-class education system for Maryland's built environment industry.

MCCEI held two IAP events, one in the Baltimore region and one in the Washington, DC region with a combined total of 72 participants (please see appendix A for a list of participants). The participants included:

42 INDUSTRY LEADERS + 21 EDUCATORS + 9 GOVERNMENT OFFICIALS = 72 PARTICIPANTS

The participants were asked a series of questions and engaged in discussion of best practices and advice on how to improve education offerings and engage industry into the process. We sought answers to:

WHAT
- **… are the most valued industry skills?**
- **… defines a benchmark program?**
- **… are the most and least valued certificate programs?**
- **… educational and academic components are needed?**

What You Are About to Read

These items and more are discussed in detail in the following pages. While we tried to stick to these four topics, a large part of the conversations centered on the image of the construction industry and its appeal (or lack of) to students at all levels.

There is a real passion in this business and a level of professional satisfaction that is unparalleled in other careers.

We invite you to read on, absorb, give feedback and get involved.

Executive Summary

The intent and purpose of *Digging Deeper – Aligning Industry and Education* is to get construction industry professionals and educators talking! Our industry needs solutions-focused conversations to take place about the changing demands, challenges and opportunities that are present in preparing the construction workforce.

MCCEI wanted to dig deeper into areas identified in the *The Critical Path* as impediments for the construction industry finding the workforce it needs. Through a series of workshops termed Industry Advisory Panels (IAPs), MCCEI along with partners from industry, education and government walked away with the following primary findings and results.

Valued Industry Skills

Regardless of educational attainment, the participants of the IAP sessions recommended that anyone seeking a career in construction, or preparing someone for careers in construction, the following basic skills and traits are paramount:

- Proven ability to get things done.
- Leadership and management skills in addition to technical education.
- Strong work ethic.
- Proficiency in the ability to read and comprehend architectural or engineering drawings and specifications.
- Knowledge of the use of architectural and engineering scales.
- Mathematic proficiency at the algebraic and geometric levels.
- Ability to communicate and articulate with reading, writing and speech.

Depending on the level of educational attainment, we have identified the following essential skills and credentials:

	High School Graduates	Apprentices	Community College and University Graduates
Academics	Finish high school and earn your diploma or GED.	Complete the program and earn the appropriate journeyman's license.	Complete your studies and earn your degree.
Technical	General knowledge of Construction Specifications Institute (CSI) divisions.	Computer skills with general office suite, email and Internet use.	Pursue and earn industry recognized designations.
On-The-Job-Experience	Some practical, construction related job experience.	Practical experience with the use of tools appropriate for the trade.	Two summers of on-site job experience.
Communications	• Proficiency with reading, writing and speaking English. • Basic Spanish. • Presentation skills and public speaking.	• Presentation skills and public speaking. • Technical reading comprehension.	• Presentation skills and public speaking. • Some bi-lingual written and oral proficiency with English and Spanish.
Personal	• Time management. • Self-accountability. • Maintain clean appearance, criminal record and driving record.	• Ability to get and maintain a security clearance. • Valid driver's license and the ability to get to and from work. • Maintain clean appearance, criminal record and driving record.	• Ability to get and maintain a security clearance. • Valid driver's license and the ability to get to and from work. • Maintain clean appearance, criminal record and driving record.

Identifying Benchmark Programs

The hallmarks of what the IAP participants consider to be benchmark, or "go to" programs, were universal for all education sources. The participants of the IAPs felt that there is no such thing as a good program or bad program as they all have the capability of producing good and bad graduates. More so, the "go to" programs all shared these common traits:

- Active and engaged advisory boards.
- Faculty members that have strong relationships to industry either through professional associations or direct engagement and have extensive work experience.
- Positive support from administrators, guidance counselors and principals that recognize the value and importance of construction related careers.

Most and Least Valued Certificate Programs

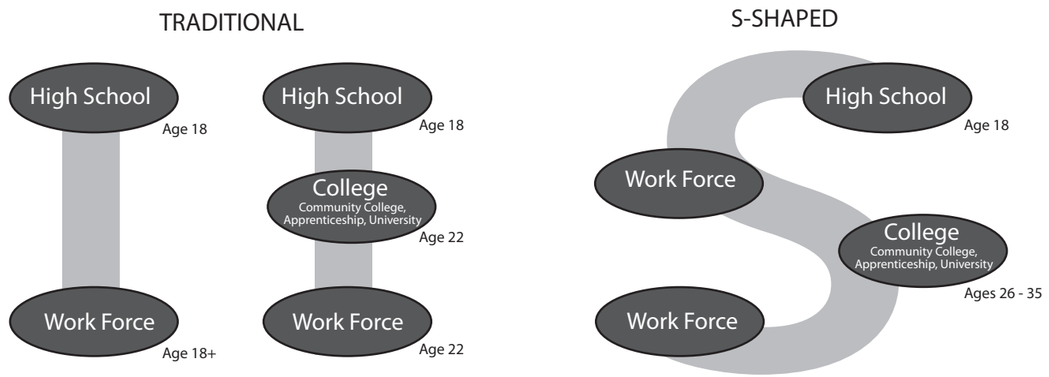
There are hundreds of certificate programs that skilled trades, construction management and design professionals can pursue, each with a different purpose and value to an employer. Through the IAP sessions, MCCEI attempted to determine which ones *get people hired* and which were viewed as *just pretty sheets of paper*.

IAP participants stated that regardless of education level, participants should be diligent in the pursuit of certificates and the time and energy spent should directly correlate to those that are valued by a specific trade or profession and ideally lead to a trade-recognized credential.

The value of certificate programs and credentials depends heavily on the *difficulty of attainment*. IAPs overall believed that any class, program or credential worth pursuing should be reasonably difficult to get, independently verified by a trusted body and maintained through continuing education.

Specific Educational and Academic Components

Aside from the technical education that one will get in pursuing trades, design or construction management, there are a host of other areas that make for well-rounded, trainable employees. Understand that not all education pathways follow the traditional, lineal path from high school to either post-secondary education or directly to the workforce. In fact, many viable pathways are S-shaped with credentials accumulated over the course of a career. IAP participants offered the following advice on specific academic content as being desirable across the entire education spectrum.



Educational Foundations

Science, Technology, Engineering and Math
- Algebra and geometry.
- Personal finance including check books, credit and W-2 provisions.
- Variety of sciences including chemistry and physics.
- 3 dimensional and spatial reasoning.

Software
- Microsoft Office Suite (Word, Excel, PowerPoint).
- Scheduling software such as Microsoft Project or Primavera.
- Project management software such as P6 or Plangrid.
- Building Information Modeling software such as AutoCAD or Revit for design and Navisworks for construction management.

Communications
- Presentation skills using PowerPoint.
- Public speaking.
- Business meeting etiquette.
- Written business communications including letters, memos and email.
- Technical writing.

Career Readiness
- Work ethic and workplace etiquette.
- Criminal records.
- Social media presence.
- Personal appearance.
- Resumes, cover letters and references.
- Personal finance and credit ratings.

Business Management
- Leadership and decision making.
- Negotiation skills.
- Revenue and cost accounting.

Part 1: Valued Industry Credentials and Skills – What the Industry Seeks

The Background

A big issue identified in *The Critical Path* report is that construction is a rapidly aging industry, which will be faced with massive amounts of retirements in the next 8-10 years. Exacerbating the problem is construction is not viewed positively for entry-level workforce. The industry's image, the cyclical nature of the business due to economic climate and a fundamental shift away from trades and technical degrees from guidance counselors in favor of 4-year college placements are all factors in dissuading people from pursuing careers in construction.

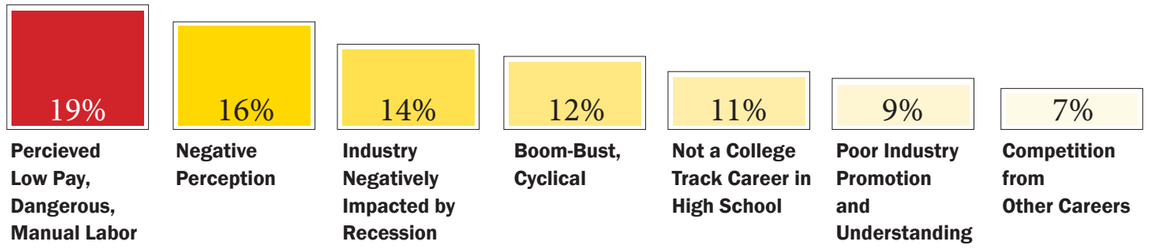
Anticipated Percentage of Total Workforce Retirements for Interviewed Companies Through 2020

MCCEI, *The Critical Path*, 2012

The Great Recession of 2007 to 2010 also played a significant role in repelling workforce entrants into construction as the industry was the hardest hit with massive drop offs in project volume and subsequent spikes in unemployment. ***In short, all of these items have helped to repel almost an entire generation of young graduates away from the business.***

Top Responses on Obstacles to Recruiting People to the Construction Industry

MCCEI, *The Critical Path*, 2012



> "Industry needs the job skills, fundamentals and general knowledge. It takes 4-5 years to train someone before they become a financial asset. Anything before that is a financial drain."

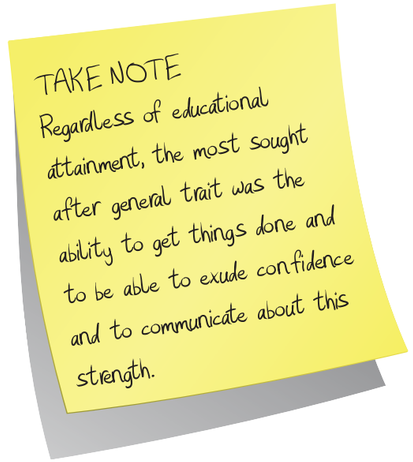
The Problem

Contrary to these trends is that many companies that maintained a backlog of work during the recession were finding it exceedingly difficult to find talented employees. The Recession caused a tremendous amount of construction talent to enter the labor market as free agents. Conventional wisdom was that highly talented labor was on sale. According to the respondents of *The Critical Path* interviews, the opposite happened. Many people that were shed into the labor market were "C-string and D-string" employees while "A and B string" talent was retained. Any A-string and B-string talent that became available was either gobbled up or left the industry all together to pursue other interests.

The Findings

What MCCEI wanted to find out from the participants of the IAPs was **what makes someone employable in the construction industry**. With this question and discussion, we attempted to identify skills, credentials or traits that the industry most seeks. The answer we found was that there is no one single credential, skill or accomplishment that differentiates the "employable" from the "don't call us, we'll call you" candidates. Rather, it is a compilation of education, skills, credentials and passion for the business that make top job candidates stand out from the rest. These items are summarized below:

> "There is no clarity of credentialing outside of licensing."



General Traits and Skills

The ability to get things done: Participants in the IAP sessions really zeroed in on this key trait. Regardless of educational attainment, the most sought after general trait was the ability to get things done and to be able to exude confidence and to communicate about this strength. For high school, college/university age people, the act of completing your education and earning a diploma is a statement of character. It proves that you have the ability to finish something difficult.

Leadership: The industry is looking for self-starters that can lead by example, instruct others, motivate a team and develop the ability to make decisions.

Work Ethic: This is the basic ability to show up on time, properly dressed and in a correct frame of mind for work. It also means that showing up to work is just that, you are there for work and productivity.

Education Competencies

Math: Participants felt that a construction professional needs to have a solid foundation in arithmetic, algebra and geometry.

Management: In secondary school and higher education we tend to teach very specific and technical skills for construction trades, management and design. Participants stated that a sound understanding of business management, accounting, human resources and financial management are equally important to the success of the industry, and maintaining employment.

Communications: Communications is the one area where the participants spent a lot of time discussing. Yes, it is true that the ability to read and write in complete sentences is a basic fundamental, but the participants acknowledged that in the age of electronic communication, many of those fundamentals are eroding. People that can demonstrate the following will be more in demand:

- The ability to write using proper sentence structure, grammar, spelling and punctuation.
- The ability to write a succinct business letter or email.
- Presentation skills including diligence to rehearse, practice, subject matter knowledge, public speaking and contextualization.
- Technical reading, writing and comprehension.
- The ability to speak to peers, supervisors and clients in a professional manner.

> "For project managers, it generally takes 5+ years to gain the technical knowledge and business management skills to become a profit center."

> "The ability to articulate versus communicate, these are two different things. Everyone can communicate in some way, not everyone can articulate."

The Commercial Group

TAKE NOTE

What students or recent graduates can do to get noticed by employers:

- Keep up your appearance.
- Practice mock interviews with teachers, counselors, parents and friends.
- Develop proper job interview etiquette.
- Develop a good resume.
- Obtain some level of relevant experience.
- Do everything you can to understand the business.

Part 1: Valued Industry Credentials and Skills – What the Industry Seeks

Industry Specific Technical Skills

Regardless of educational attainment, the IAP participants cited the following as desirable skills:

- Ability to read and comprehend architectural and engineering drawings and specifications.
- The know how to use architectural and engineering scales for measurements and plan interpretations.
- Some level of safety training with OSHA 10 hour certification at a minimum.
- General knowledge of the divisions and components all construction projects as defined by the Construction Specifications Institute (CSI).

Skills and traits needed based on educational attainment level

Specific to educational attainment, the IAP participants offered the following advice for educators and potential career entrants:

High School Students/Recent Graduates

- Basic ability to read architectural plans and interpret scale measurements.
- OSHA 10 hour safety training.
- Some past experience in cost estimating, project management and scheduling.
- Understanding business components of a construction company.
- Hands-on site layout experience.
- Technical manual comprehension. (Note 1)
- High school level math including algebra, geometry, consumer math and personal finance.
- Leadership skills including team work and solving problems.
- Verbal communications with the Toastmasters program cited as an example.
- Basic bi-lingual communication with Spanish.
- Presentation skills and public speaking. Understand that you are a representative of the company when speaking with peers or clients.
- Time management.
- Self-accountability.

Note1: It was noted that the high school programs are shifting over already to technical manual reading and interpretation through the new Common Core Curriculum.

Apprenticeship Applicants and Community College:

The participants in the IAPs also offered this specific advice to apprenticeship applicants and community college students that would make them employable.

- The use of architectural and engineering scales. Every program teaches to scale (models/drawings), but not every program teaches how to use a scale to get dimensions from drawings.
- Architectural and engineering plan and specification reading.
- The knowledge and use of different tools.
- Hands-on technical/mechanical ability.
- Certificate in OSHA 10 hour safety training at a minimum.
- Certificate in confined space entry.
- Knowledge and practice in cost estimating and project management.
- College level math skills including algebra and geometry.
- Understanding of the construction business and the needs of the employer.
- Computer skills including standard office products such as word processing, spread sheets, presentations, email and Internet.
- Relevant and related work experience, preferably on a jobsite.
- Basic career readiness including the ability to pass a drug and alcohol screening and a criminal background check.
- Possession of a valid driver's license and the means to get to and from work.
- License or credential as appropriate for the job.

University Level

The IAP participants mostly agree that people going through a university level program are more than likely going after jobs in the management realm, such as superintendents, project managers, engineers and architects. In many ways, the degree itself is the main credential that makes the holder immediately employable. However, **there are a number of credentials that professionals can pursue in order to enhance their marketability to potential employers**.

There are dozens of different professional credentials with some more highly regarded than others. We attempted to get the IAP participants to identify the truly recognized credentials and those that are not worth the paper they are printed on. The answer was the professional credentials are all valuable and there is no cut and dry standard. What the industry values is the following:

1. The graduate should have at least two summers of on-site field experience.
2. A valued, professional credential, which is independently certified by a recognized and trusted industry group.
   - ✓ It must be difficult to get and must be maintained over the course of a career, which is a demonstration of self-determination, motivation and character.
   - ✓ The credential needs to be able to show aptitude learned through experience and competence obtained through education and practice.

Valued Credential Examples Upon Graduation

For Architects - The Registered Architect (RA) designation that leads to the AIA designation as administered through the American Institute of Architects.

For Engineers – The Engineer in Training (EIT) designation for recent university graduates which leads to the Professional Engineer (PE) designation as administered by the American Society of Civil Engineers (ASCE).

For Construction Managers – The Certified Construction Manager (CCM) designation as administered by the Construction Management Association of America (CMAA).

For all of the above - The Leadership in Energy Efficient Design – Accredited Professional (LEED-AP) designation as administered by the United States Green Building Council.

What the industry does not value is the credential that is equivalent to paying a fee and passing a test. These items, while superficially may look good on a business card, are not the same measure of character, motivation and accomplishment.

TAKE NOTE

The primary motivation of the employer when it comes to earning professional credentials is the client's demand for certified professionals to work on their projects. If the resume alphabet soup of credentials is not recognized by the consumers of construction and design services, the applicant is better off not pursuing the credential.

> "School systems eliminated wood, metal and auto shops from programs creating this innate inability on how to use tools."

> "A college degree works towards attaining credentials. The degree is great, but candidates need to have a lifelong learning mindset."

"Many of the school system expectations do not correspond with the real world."

"Benchmark schools have good track records and active graduates that do mentoring."

"Create an environment where school is where you want your child to be. Can parents and businesses do anything to help out? When you get to that point, it is not just a school anymore."

Part 2: Benchmark Programs

In the world of education, perhaps it is human nature to seek out the best. Schools, programs and institutions earn good and bad reputations, sometimes deserved, sometimes not. There are no shortages of national or regional rankings of schools and there is no shortage of the desire to be ranked #1. MCCEI wanted to find out what the industry sees as the "go-to" programs. We also wanted to find out what made a program have a good or bad reputation and for the "good ones" what made them that way. The results are as follows:

Two Hallmarks of a Benchmark Program

1. **Positive administration** within the school is important to ensure a supportive and positive culture for faculty and staff.

2. **Industry involvement** with instructors that are recognized by the industry and that have good relationships with the local industry. The industry-education relationships need to be two way:

- Business to Education: Sourcing for open positions.
- Education to Business: Guest lecturers.
- Business to Education: Training for new technologies.
- Education to Business: Donations of materials and tools.

Industry involvement with active and relevant participation as program advisors, guest lecturers, mentors, providers of summer internships or other employment opportunities to get students trained with the required work experience.

Surrounding industry involvement and recognized faculty is that benchmark programs have curricula and teaching philosophies that the industry trusts. That trust is earned in two primary ways:

1. Faculty teaching that has practical and hands-on experience in the industry.
2. Industry has some significant level of influence in crafting the curricula.

Identifying Existing Benchmark Programs

When asked to name the benchmark programs and why they have earned this distinction, the IAP participants offered the following:

(Please note that this is just the named schools that participants mentioned during the course of the IAPs. This is neither an endorsement for nor an indictment against any school that is or is not listed.)

High School Programs

- Thomas Edison High School of Technology, Silver Spring, MD. (Montgomery County)
- Center of Applied Technologies – North, Severn, MD. (Anne Arundel County)
- Center of Applied Technologies – South, Edgewater, MD. (Anne Arundel County)
- Northpoint High School, Waldorf, MD. (Charles County)
- Suitland High School, Suitland, MD. (Prince George's County)

The common thread that the IAP participants stated as the reason these programs were mentioned by name is that they all have:

- ✓ Industry involvement through active advisory boards;
- ✓ A faculty member with deep ties to the industry;
- ✓ And, a curriculum that is a blend of theory and applied curricula.

Also noted was the Architecture, Construction and Engineering (ACE) Mentorship programs that are prevalent throughout Maryland. ACE Mentorship places volunteer industry practitioners with groups of students to work on a project based learning assignment. Students and mentors are assigned to project teams and work on a mock design project for the duration of a school year. Students apply what they have learned in the classroom and the mentors guide them through the thought processes, teach the industry vocabulary and help them with taking their project to a presentation ready status.

Apprenticeship Programs: The Other 4-Year Degree

An apprenticeship is a dedicated and difficult education pathway that combines classroom instruction and on-the-job experience for highly skilled trades and technical jobs. Typically, an apprenticeship blends 144 hours of classroom instruction and 2,000 hours of practical experience under the guidance of a master craftsman. In many circumstances, the classroom instruction is done at local community colleges and the educational experience can be articulated into credits towards an associate degree.

The end goal of an apprenticeship is to combine classroom and on-the-job training into a formal education program that results in the ability to pass a licensing exam to become a journeyman trades professional. Essentially, an apprenticeship is the equivalent of a four to five year technical degree and the license is the diploma.

Benchmark Apprenticeship Programs

Across the board, Maryland has highly recognized, trusted and valued apprenticeship programs which are held to high benchmark status. The one example that was given was the IBEW Local 26 Joint Apprenticeship Training Council. What made Local 26 JATC stand out was:

- State of the art facilities.
- Nationally recognized curriculum.
- Recognized and trusted director and faculty.
- Contractor funded.
- High standards for admission.
- Emphasis on retaining students to complete the program.
- As an industry funded program, it is more apt to change and update equipment.

TAKE NOTE

Most high school CTE programs do not articulate into apprenticeship programs in Maryland. With apprenticeships, everyone starts at the same place, often repeating classes and credits already covered in high school.

Who is entering apprenticeship programs?

It was noted that apprenticeship programs tend not to attract students right out of high school as is typical with 4-year universities. The reason is that apprenticeship programs tend to be selective and some have rigorous entry requirements that require some level of practical experience. High school students that have gone through pre-apprenticeship classes and/or trades classes at the CTE level are prime candidates for apprenticeships over general education students that have no answer to the question "now what?" after graduation.

Apprenticeship is attracting people later in life as maturity and experience levels increase and it becomes more apparent that it is a pathway to greater earning potential and career stability. Apprenticeships have grown into one of the S-shaped pathways and are largely misunderstood by the general public.

TAKE NOTE

Application to apprentice programs has grown in recent years, but acceptance into a program is highly selective and limited to the number of sponsor companies. In order for companies to sponsor an apprenticeship, there needs to be sufficient demand for additional labor and positions.

"Activity based learning is gaining popularity and the classroom model is starting to wane."

"Apprenticeships and licensing vs. degree completion to industry relevance – there is a big disconnect."

"We do not know how many people graduate from high school or CTE and go on to apprenticeship. We need statewide articulation of high school to apprenticeships."

> “Proof, kids between the ages of 16-18 have a 70-80% success rate moving on to apprenticeship programs that have some practical experience.”

> “There is a different level of education in college vs. high school. In leadership, communication and critical thinking, college fills the gap that is not developed in high school.”

Part 2: Benchmark Programs

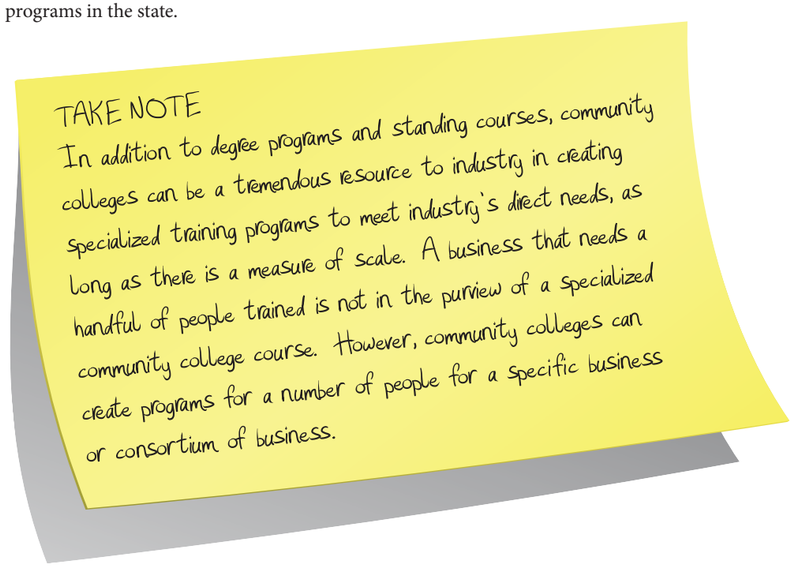
An apprenticeship is a job that requires a company to actually pay the apprentice a commensurate wage while they obtain their on-the-job training and classroom experience. The Great Recession caused many construction companies to scale back on hiring and reduce their workforce. Simply, there have not been enough jobs in the industry to meet potential demand from potential apprentices. Companies could be highly selective for the few open apprenticeship slots. Construction volume will have to increase before new slots are created as companies are still recovering from the Great Recession, trying to do more with less and avoiding the addition of workforce unless absolutely necessary.

As the economy improves and construction project volume grows, there will be increasing demand for skilled craft professionals, especially as the older generations retire. The pathway to apprenticeship may become more attractive for high school students. IAP participants recommended increased outreach to guidance counselors about the benefits and opportunities for apprenticeships:

- Increasing demand for skilled craft professionals.
- Competitive salaries and benefits packages.
- A four-year degree equivalent with the ability to “earn while you learn” versus incurring massive costs for college tuition, books, room and board.

Community College Programs

Maryland has a wide variety of community colleges that offer associate degrees or course offerings in construction trades or construction management. There was no significant discussion on which were the benchmark programs except for the Community College of Baltimore County (CCBC), Frederick Community College (FCC) and Montgomery Community College (MCC), which has participants in the IAPs and are probably the most well-known programs in the state.



Maryland Community Colleges with Associate Degree Programs in Construction Management

1. Anne Arundel Community College.
2. Community College of Baltimore County.
3. Frederick Community College.
4. Howard Community College.
5. Montgomery College.
6. Prince George’s Community College.
7. College of Southern Maryland.

Community Colleges with Courses in Construction Trades or Design

1. Baltimore City Community College.
2. Hagerstown Community College.
3. Harford Community College.
4. Wor-Wic Community College.

Community College Enrollment Trends

The recent trend is that students are not immediately enrolling in community colleges from high school. The average age of the community college student entering a construction program is 26. Businesses also tend to prefer bachelor degree graduates. A running philosophy through many construction businesses is to hire right out of college and begin training to the specific company way. A community college graduate entering at age 26 and earning an associate degree a couple years later has missed that window.

Industry awareness of community colleges is also hampered by geography. By design, community colleges serve local and regional populations that commute to and from campus. A company in Prince George’s County may have a hiring need and may not be aware (or even think to look) that Frederick Community College or Community College of Baltimore County is producing exactly what they need.

> “The high school system overall is not a strong feeder for community colleges.”

> “Working during the day, plus going to school at night, shows passion for the industry and lifelong learning. This is what business is looking for.”

In a subsequent discussion with community college program directors, we have identified the following key improvements needed to meet the needs of industry:

- ✓ **More buy-in and participation** from industry. **Get involved** in some of the program advisory boards or curriculum review.
- ✓ Partnerships to **create training programs** that can augment or supplement the degree offerings.
- ✓ Facilitate internships that **offer hands-on experience** and **on-the-job training**.
- ✓ **Develop** apprenticeships and **formalize** internships. Industry needs to **clearly define the desired program outcomes** and be willing to **commit** to hiring students at a market rate that makes it “worth it” for the students.

Spotlight on Co-op Programs

The IAP participants mentioned co-op programs at either Drexel University or the University of Cincinnati numerous times. The co-op experience offers many benefits over a conventional 4-year college.

Regardless of co-op programs or conventional 4-year degrees with summer internships, construction management and engineering degrees are highly technical, difficult to get and are perceived to have lower earning potential than other professions, such as finance or information technology. Many students are choosing less scientific and math heavy degrees in order to pursue "easier" fields of study.

The benefits of a Co-op Program

- Requires a significant level of work experience in order to graduate.
- Allows companies to test out potential employees before graduation.
- Students earn salaries while in school potentially reducing costs of education.
- Students get to see classroom instruction applied in real time business situations.
- Students get exposure to business situations and accustomed to company cultures.

The drawbacks of Co-op Programs

- Time to graduation is extended by a minimum of 1 year affecting universities 4 year graduation rates and a student's full time entry into the workforce.
- A student must be dedicated and passionate about the program upon entry. If they decide that this field of study and profession is really not for them, then a significant amount of time and energy may have been lost.

"Most construction management programs are spun out of civil engineering programs and are heavily based on calculus. Do we really need this?"

Part 2: Benchmark Programs

4-Year Universities

As with high school programs, the common characteristics of a 4-year benchmark program are a recognized and trusted curriculum, industry involvement and respected faculty.

The IAP participants noted the following programs and reasons of why they are the preferred hiring sources:

University of Florida Construction Management
the focus is on technology with roots in the building industry.
Myers-Lawson School at Virginia Tech
modeled off of what industry needs, reputation for being a rigorous program that is highly selective and produces quality graduates.
Ferris State University
viewed as a very practical and relevant program with a strong focus on field applications and staff of industry practitioners turned teachers.
Penn College of Technology
program that blends theory and hands-on experience.
Penn State University's Architectural and Structural Engineering program
a selective and relevant program with a good reputation.
Pace University
its construction program was designed by the industry.

Online Learning Trend

One option that could increase the number of students that pursue bachelor's degrees in construction management, architecture or engineering is the trend of online learning. Many colleges are offering Massive Open Online Courses (MOOC's) and accepting credits from same. MOOC's allow students to earn credits for a degree at a fraction of the cost of traditional, in-class formats while being able to learn at an appropriate pace.

The jury is still out on online courses as they are viewed as more of a "diploma mill" type format, taking a cue from the discussions earlier on the relevant credentials. There is also the fact that the student does not get the same experience of being on campus and the interaction with peers, but it may be a positive in that it certainly will be able to improve electronic communication skills.

Part 3: Most and Least Valued Certifications

With respect to trying to align Maryland's education system with future industry demands, MCCEI wanted to dig deeper into what the industry truly values. Through our research, we found that there are hundreds of different training courses a professional can take to either earn a certificate or professional designation. All of these show some level of competence which ranged from very broad to extremely specific. The idea was to get the IAP participants to identify which certifications jump off of a resume, application or business card. Those certifications could then be reviewed and possibly worked into the state's education curricula.

The Findings

The general responses echoed the conversations around credentials, skills and traits. **The most valued and recognized certifications are the ones that a practitioner has to demonstrate competency to get, must be maintained to keep and must be sufficiently difficult to attain.** The lesser valued certifications are the ones where the practitioner memorizes course material long enough to pass a test, and pays a fee to get the certification.

The true importance of attaining certification is two-fold:

1. There is a proof of knowledge and competence.
2. There is a personal motivation and aptitude to see it through to the end.

However, unlike other professions, there are no "plug and play" certifications that make one person a more attractive potential hire than the other. Some IAP participants felt that there is no such thing as a valueless certification as they all have some sort of relevance as they pertain to certain jobs.

Most valued certifications, by trade

All professional trade certifications have some level of value and recognition. The premise of a certification is to show that the incumbent has had training for a specific skill taught by a recognized teacher along a vetted curriculum. What industry values and recognizes depends on the job.


The Whiting-Turner Contracting Company

"Show an employer that you have the ability to get things done, all else can be trained."

MOST VALUED CERTIFICATIONS BY TRADE AND PROFESSION

FOR ENGINEERS
The Professional Engineer (PE) designation is highly valued.

FOR ARCHITECTS
The AIA Certification is highly valued.

FOR SKILLED TRADE PROFESSIONALS
A license in the trade is the most valued certification to earn.
The journeyman's license is highly regarded as it shows the ability to succeed and complete an apprenticeship, which is a difficult and rigorous program of combined on-the-job training and classroom education.

FOR ARCHITECTS, ENGINEERS AND CONSTRUCTORS COMBINED
Leadership in Energy Efficient Design – Accredited Professional (LEED-AP) is also recognized, but there are many levels of LEED certifications and the rules keep changing that its value, while important, is diluted.
OSHA 30 Safety Training certification is preferable with OSHA 10 Hour Safety Training at a minimum.
Advanced degrees are not necessary to be a recognized practitioner. Advanced degrees can be valuable if there is a client base that recognizes the achievement.
Master of Business Administration (MBA) is valuable as it shows the aptitude to be technically proficient with advanced business management education.
Advanced degrees earned while employed through continuing education programs are valuable as it demonstrates tenacity and personal drive. The advanced degree should be relative and tangible to the industry.

FOR CONSTRUCTION MANAGERS
Certified Construction Manager (CCM) certification through the Construction Management Association of America (CMAA).
Project Management Professional (PMP) through the Project Management Institute (PMI) is also recognized but less regarded than the CCM designation.

> "The world's greatest artists were also master builders."

> "Where we are suffering is having superintendents on jobs that have limited field experience. No longer have the guy that knows how it all works."

The Christman Company

Part 3: Most and Least Valued Certifications

Most valued certifications, for high school students

For future high school graduates considering careers in skilled trades, some limited certifications can be earned, but the items most valued are attitude, willingness to learn, aptitude and experience.

Certifications are good, but in many cases, an entry-level career seeker cannot earn certifications as most come with requirements of accompanied work experience. High school appropriate certifications in the following areas, especially where curricula by NCCER are used, are highly desired:

- Welding.
- OSHA 10 Safety Training.
- Knowledge of building codes, tools and trades.
- Exposure to conversational Spanish.
- Experience with Building Information Modeling.

The IAP participants reinforced the discussion on skills and credentials:

- ✓ Employers are looking for the top of the class. If you have the drive and determination to work in this business, then this industry will consider you.
- ✓ Good work records. The importance of learning the basics of work etiquette is very important. For example, reporting to work on time, staying at work past quitting time, being professionally dressed for the job, being of the clear and lucid mind during work hours, focusing on the job and not on social media feeds or contact with acquaintances, etc.
- ✓ Professional resume. A high school student should have a professional resume and all of the necessary items to complete a job application.
- ✓ School awards. Businesses do pay attention to school awards such as attendance, most improved and honors, as all are reflections of ability and character.

Practical Field Experience

One of the most active topics of discussion among the IAP participants was the need for high school students with practical field experience and the quandary that field experience is nearly impossible to get for those under the age of 18. Insurance regulations, child labor laws, jobsite safety, project management, school transportation and many other issues all but prohibit high school students from getting field experience that the industry wants the emerging workforce to have. Students have other options to pursue summer or part-time jobs in related areas. Such areas should show a willingness to work hard and get one's hands dirty, such as:

- Landscaping.
- Retail (Lowe's, Home Depot, hardware stores, lumber yards, etc.).
- Painting.
- Warehouses, distribution and logistics.

BIM Competence

The participants of the IAPs also had lengthy discussions on **Building Information Modeling (BIM)** and its rapidly rising prominence in the construction industry. It is important to differentiate that BIM is not software; however, software is one tool in the practice and application of BIM. BIM proficiency needs a solid foundation of knowledge and experience in design, engineering and construction. Think of it this way, teaching BIM as a collection of software to someone, regardless of age, that has no practical or hands-on experience in building is the equivalent of teaching a doctor how to perform surgery without ever experimenting on a cadaver, or touching a live patient. In a word, pointless.

As discussed in *The Critical Path*, the technological advances occurring in construction due to BIM are changing the way this business functions. High school students have an incredible opportunity to learn the business, the trades, the technology and the software to become the nation's future construction business leaders. The rapidly aging construction workforce and pending brain drain that will occur as older professionals retire will open up vast opportunities for career advancement, business creation and entrepreneurship.

Conclusion

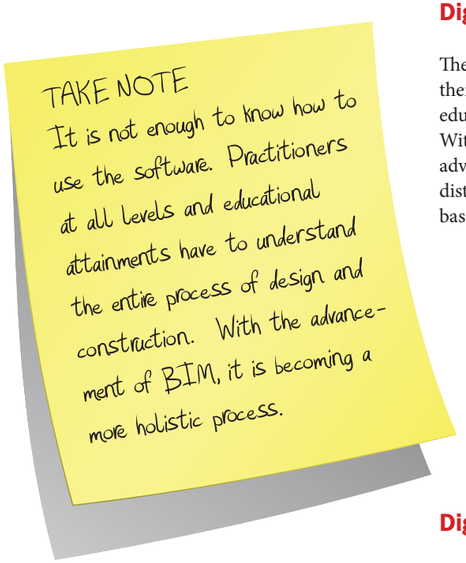
All professional certifications have value at some level. Built environment professionals need to be aware that getting certified in "fill in the blank" for the sake of getting certified may be throwing time and resources away in the pursuit of fancy papers. The paper means nothing if there is not a core base of competency behind it or a proven need by the business that would provide value to its customers. Certifications can demonstrate personal drive and professional aptitude but practitioners should choose wisely.

Gilbane Building Company

> "BIM ought to be in every class. It is the way the industry is going and those that know it have a direct ticket to a job. Lots of companies don't get this."

> "It's difficult for old guys to keep up with technology. As construction gets more technical, businesses are shutting down that can't adapt, creating golden opportunities for young people."

> "These are not all or nothing propositions. If you missed something, there is room for you, and you can always go back and get it."



> "A project manager that completes 2+ years of apprenticeship training then gets a degree is perfect. They understand the superintendent's point of view."

Part 4: Digging Deeper into Educational Composition

While interviewing the respondents for *The Critical Path* report in 2011 and 2012, we asked the participants to identify what areas of Maryland's education system needed the most attention to improve the workforce pipeline for the built environment. We found the skills and knowledge base that needed the most improvement were field experience, computer technologies including Building Information Modeling, math and science, communications, career readiness and business management. Please reference the graphic on page 3 for details.

Digging Deeper: BIM, Design, and Computer Technology

The participants of the IAPs identified the following details along with one overarching theme: It is not enough to know how to use the software. Practitioners at all levels and educational attainments have to understand the entire process of design and construction. With the advancement of BIM, it is becoming a more holistic process. The participants also advised that zeroing in on specific software products should be avoided as while they are all distinct, they more or less accomplish the same thing. The larger focus should be on the basic foundations of education. Software needs include:

- Scheduling programs: Microsoft Project and Primavera.
- Exposure to several different BIM software packages.
- AutoCAD/Revit for design.
- Navisworks for construction.
- Estimating software like Timberline or MC2 which will eventually die off in lieu of BIM.
- Job costing and accounting software.
- P6 or Plangrid for project management.
- Microsoft Office Suite (Word, Excel, PowerPoint, Outlook) for general business use.

Digging Deeper: Field Experience

Universally, the participants of the IAPs circled around field experience as a crucial component for entry-level construction professionals.

Baseline field experience includes:

- High School Students - Six months doing something relevant and related.
- College and University Students: Minimum of two summers while taking classes in hands-on construction such as framing, concrete, masonry or something equally relevant.

The IAP participants stated repeatedly the importance of internships and co-operative programs as critical ways to get hands-on experience. To the industry, the internship is a way to measure the caliber of the student and train them to think on their feet.

There were some cautions mentioned on internships in that there are some employers that view internships as free labor instead of as meaningful learning opportunities. Internships must be relevant to the job or profession and provide for learning opportunities. Companies that abuse this do nothing except help to dissuade people from continuing to pursue careers in construction over a bad internship experience.

Digging Deeper: Math and Science

IAP participants identified the following courses that are most relevant to construction:

- Algebra.
- Geometry.
- Variety of sciences including chemistry, geology, physics, doesn't need to be at the AP level, but a good exposure.

Other Math:

- Personal finance including debt management and credit cards.
- Checkbook balancing, banking and retirement savings.
- Understanding a W-2 and a paystub – Social Security, Medicare, FICA, FUITA, SUITA, insurance deductions.

Digging Deeper: Communications and Interpersonal Skills

IAP participants identified the following as needed communication and interpersonal skills:

- Public speaking. Speech classes or a program like Toastmasters to get people comfortable in front of, or speaking before, a crowd or group are good options for improving this skill.
- Good PowerPoint presentation skills to both compose and present.
- Ability to summarize key elements of an executive summary.
- Good listening skills.
- Technical writing – the three paragraph business letter.
- Basic email protocols such as, when to send an email, reply times, who to send, reply vs. reply all, grammar, punctuation.

> "Construction managers need a good algebra and geometry foundation. Anything more than that, we have engineers to go to."

> "Communication is not the same as articulation. Articulation includes interpersonal skills and presentations."

Spotlight on Security Clearances

In the Baltimore-Washington area, there is obviously a lot of work for the government or with government contractors. Often times, individuals must have a security clearance to even get into an installation or get admission onto a military base. Very few people can get security clearances and even fewer can pass the government personality test. The slightest blemish on a criminal record, driving infractions (disobeying the law through speed limits, lights and signs) or poor personal financial standing (higher risk of accepting a bribe or compensation for information) can prevent a person from obtaining a security clearance. This is all part of career readiness.

Why does a security clearance matter?

One IAP participant summed it up best by stating

> **"When industry finds people with security clearances, they earn 20-25% more in salary and are the ones that the company will keep the longest before considering a layoff."**

Part 4: Digging Deeper into Educational Composition

Digging Deeper: Career Readiness

The IAP participants spent considerable time focusing on career readiness and reputation maintenance. They reinforced the need for potential employees to show up on time and to know where to report and to whom. Additionally, they identified the following as key things that employers are looking out for:

Debt and personal finance – Good credit scores and financial stability are measures of character and often indicators of potential employment longevity. The cost to hire and train new employees is significant and an employer wants to make sure a new employee doesn't leave to get $1.00 more per hour somewhere else.

Personal appearance – At all levels of the job, personal appearance is important. During the interview process, the rule of thumb is to think of the position you are going for then go one level higher. For example, if you are interviewing for a skilled trade job that requires work boots, durable pants, and appropriate shirt, you would show up to the interview in casual dress shoes, khakis and a shirt with a collar. In professional level interviews, one cannot go wrong with a suit and tie.

Etiquette and dining – During an interview process, you may be asked to meet for a meal. These are often tests to see if you can entertain a potential client. Poor table manners or etiquette could mean the difference between an offer or not.

Interview skills – Career seekers should be cognizant of body language, facial expressions and apparel during the interview process.

Relate-ability – Construction is a business based on relationships. Often times, the thread on which to build rapport with a peer, supervisor or client goes beyond the business realm. Find the common thread to build rapport such as sports, cooking, books or business practice and build from there.

Good citizenry:

- Criminal records – the importance of not earning a criminal record in the first place, but owning up to mistakes and taking appropriate steps to make amends.
- Drivers licenses – shows the ability to get to and from work.
- Social media presence – growing exponentially in popularity, social media is another avenue to check on potential employees for character and values, more reasons to say no.
- Civically engaged – community involvement, volunteer, groups and associations.

Digging Deeper: General Business Management

The IAP participants spent considerable time focusing on general business management training as a desired skill for construction professionals. We, as a society and education system, do quite well at training and producing specialists. The construction industry is full of brilliant engineers that can solve any problem presented. It has exceptional craftsmen that can build anything that is designed. The missing piece is to have people that can also understand and appreciate the business aspects and decision making impacts in the business of construction. Items like accounting, financial and cash flow management, business development and contract management are vitally important to the industry.

- Leadership and project management skills.
- Decision making and negotiation skills.
- Fiscal responsibility and budget management.

> "There is little to no respect between the trades and the management side of the business because the two sides don't always understand each other."

Part 5: Marketing, Messaging and the Value Proposition

As with any type of open-ended discussions where a group of passionate individuals get together to have in-depth conversations about business and education, one should expect the conversation to go off on some tangents.

> "There is too much focus on the career pathways in high school. You are presented with one of two choices: 1) Honors path to college, which is good; or, 2) Technical path not to college, which is bad."

Seeing beyond the obvious – better awareness of careers and pathways

To be able to attract more potential candidates to the business, the image of construction needs to change. The common perceptions are that construction is unsophisticated, dirty, dangerous and difficult. That is true for a section of the business, but there are numerous career paths that can take people to any level that they wish to go.

The image of construction for many goes no further than the road crew toiling in the summer heat and snarling traffic or foul-mouthed, cat-callers as portrayed in cartoons, movies and television. **What needs to get out is that construction is more than tool belts, hard hats and havens for D students.** The message and image that needs to make it into the minds of parents, guidance counselors and students is:

- This business works with brains as much as it works with hands.
- There is a sense of accomplishment at the end of each work day.
- Your efforts are creating something that will impact people's lives for years or decades to come.
- No two days are alike.
- This is a business that has as much white collar influence through architects, engineers, accountants, lawyers, finance, marketing and management as any other.
- The magic happens on site through the coordinated work and efforts of a project manager, superintendent, foremen and any number of skilled trade and craft professionals.

Beyond the relatively unknown image of construction, the message has to get out that this business is not what it was 20-30 years ago. It is emerging into a very high tech, computer driven business that is more materials and logistics management than grunt labor and heavy lifting. Aside from the variety and accomplishment listed previously, careers in construction can offer salaries and benefits that often exceed those of college degreed positions with a fraction of the cost of post-secondary education.

Mindset: The Road to Success is a College Degree. Ponder: Who built the road?

One of the largest divides is in the awareness and acceptance of construction careers as equal opportunities, or even viable options by career counselors. A common perception amongst industry practitioners is that career counselors have fallen into the trap that all kids must go to college to be successful. This push at the high school level has industry believing that many high school students that could be viable candidates for successful careers in skilled trades are not even being informed of these options. Rather, through the evaluation of standardized test scores and aptitude profiles, counselors are steering any student that <u>can</u> go to college to do so, regardless of any consideration of whether or not they <u>should</u>.

TAKE NOTE

In many ways, the issues associated with aligning the construction industry and education are more of an issue with the "inputs" than what the education system produces as "outputs." The construction industry has a terrible image and does a poor job of making people aware of the many career opportunities. The education system can only do so much and many IAP participants said that it is time for the industry to step up its game and get more involved.

> "The trades are not what you think. We all go to the ditch digger analogy. 'I don't want my kid to be a ditch digger!' What parents don't realize is that the modern ditch digger makes $75,000 per year and operates a multi-million dollar piece of equipment."

> In places like Anne Arundel County, the 'all kids must go to college' mindset is prevalent. Construction is perceived as a not smart, dirty business.

> There is a lack of understanding and comprehension that technical careers can do very well without the expense and time spent on a college education.

Skanska USA

> We have a white collar workforce in Maryland. It comes down to marketing. Workforce agencies don't get it.

Part 5: Marketing, Messaging and the Value Proposition

In all fairness to school administrators and guidance counselors, in the wake of the Great Recession, there is overwhelming evidence that people with college degrees had far less unemployment and were unemployed for far shorter periods of time than people with high school diplomas, GED's or less. There is also overwhelming evidence that people with college degrees have higher lifetime earnings potential than people with high school diplomas, GED's or less. So really, who can blame the counselors for simply doing their jobs?

Many IAP participants mentioned, and construction industry executives know, that construction trades can be an exception to this perception, especially when students take an apprenticeship pathway. The benefits of an apprenticeship are that it is a highly vetted and rigorous learning environment through on-the-job training and classroom instruction. While the typical 4-year college student is racking up huge expenses for tuition, books, room and board, the apprentice is getting paid doing a relevant job while they learn a profession. An apprentice that "graduates" to journeyman status will have much more of a head start on their college graduate peers on lifelong earning but will also not be saddled with student loan debt or drained bank accounts.

Changing the Image, Crafting the Message

At its essence, construction is really a business about problem solving. Hammering nails, running pipe, three dimensional modeling and just-in-time-deliveries are really solutions to the numerous problems of taking an owner's needs and an architect's vision and turning it into a structurally sound and functional building.

When presented with the problems the industry's education needs and workforce vision, rooms full of problem solvers will naturally complain about it for a few minutes then start crafting solutions. The Industry Advisory Panels were no exceptions. Participants were long on ideas of what we collectively as an industry, education and government partnership need to do to strengthen the workforce pipeline and provide opportunities for Marylanders to engage in long and fruitful careers.

- Better marketing of career opportunities.
- Make the value play argument.
- Not everyone needs to go to college.
- More engagement by business in the education process.

Better Marketing of Career Opportunities

The participants of the IAP sessions had nearly universal agreement that there needed to be better marketing of career options. There was also universal acknowledgement that the one thing we did not have is multi-million dollar budgets for traditional marketing campaigns through web, social media, print, TV, radio, etc. Some suggestions were:

Classifying construction management and trades as Science, Technology, Engineering and Mathematics (STEM) careers. They clearly are, just not under the currently accepted definitions of what STEM is being promoted.

Expand opportunities for students, parents, teachers, guidance counselors and advisers to learn more about career opportunities in construction.

- Partnerships with local libraries, as they are hubs of many communities.
- Recruitment of high school students to apprenticeships and college programs.
- Career discovery camps.
- Booths and outreach at state wide teacher gatherings.

Do better outreach and messaging to career and guidance counselors.

- Send the message of higher education requirements and benefits of a career.
- Communication with counselors through video.
- Offer to host a "train the trainer" event or symposium with guidance counselors.
- Create and promote case studies of success.

Elevate the understanding of construction management as a career.

- Civil engineering and skilled trades alone are not addressing the needs of the industry.
- Need to convey at the high school level that engineering alone is theory, construction management is practice and it is technology driven.

Alternatives to a 4-Year Degree: The Value Play

Not all careers in construction need a 4-year bachelor's degree. Not all 4-year bachelor's degrees are in high demand nor are they necessarily the ticket to a sustainable career. Indeed there are numerous construction career options along the entire education spectrum with high school diplomas, community colleges and apprenticeships. We should:

Develop a case study showing the projections and calculations on the return on the educational dollar.

- How much and how long for education versus the earnings potential?
- How long to complete a program (certificate, apprenticeship, community college)?
- Earnings during education period.
- Debt incurred for education expenses.
- Salary upon graduation.
- Employability over a career.

Make the education pathway more open by the improvement of articulations between programs.

- Articulate industry credentials into college credits.
- Articulate apprenticeships to college credits.
- Articulate experience into college credits.

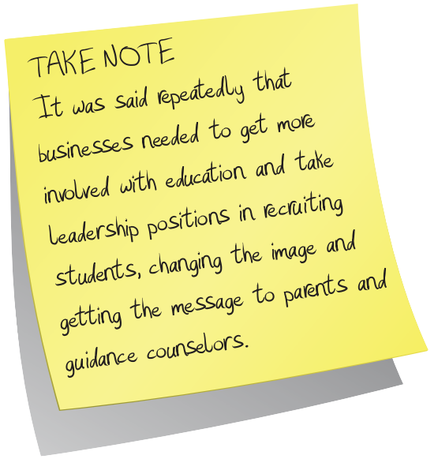
Barton Malow Construction Services

> The big disconnect is in awareness. The bigger disconnect is with parents and guidance counselors.

> 20+ years ago, we began relying less and less on experienced field practitioners and began going the construction management route.

> There is a conflict between colleges and 4-year graduation rates versus employable graduates.

> Change emphasis from college to post-secondary education.



> "Industry cuts off its own leg in spite of itself regarding tuition reimbursement. They do not reimburse or pay extra for when someone goes on to more education. So the student or employee thinks 'Why bother?'"

Part 5: Marketing, Messaging and the Value Proposition

Industry needs to take a leadership position and get more involved.

IAP participants were quick to point out that the industry itself is one of the root causes of the lack of awareness of career options. It was said repeatedly that businesses needed to get more involved with education and take leadership positions in recruiting students, changing the image, and getting the message to parents and guidance counselor. Participants suggested the business community should:

- Create better partnerships with education for things like internships, summer training facilities, financial aid and continuing education.
- Get involved with program advisory boards, curriculum and program review.
- Form speaker bureaus to get business owners and executives into classrooms for guest lectures and career exploration days.
- Communicate what industry is looking for with attainments, skills and behavioral aptitudes.
- Putting a professional face on the industry.

As discussed by the IAP participants, there are numerous ways where the business and education community can work together to promote the various career opportunities. Industry itself realizes that it must take a leadership role and realize that education is its partner. Education must realize that construction is a rapidly evolving business that is becoming increasingly technical. These advancements are creating numerous opportunities at all education levels and the careers of the future will require a much more highly educated workforce even if they carry names like carpenter, mason and plumber.

Conclusions

After two advisory sessions where professionals from the construction industry and education came together to discuss what is most needed for the construction industry for skills, credentials, attainments and certifications, there are a number of items that can be emphasized in future education curricula.

1. **There should be no separation between industry and education.** Students at any education level from high school through university should actively engage in getting real life experience. Industry should actively engage to lead the process and get involved with advisory boards, internships, programs, students and faculty.
2. **Mathematics, communications, technology, finance and business are just as important as hands-on skills.** Neither can survive without the other.
3. **Industry and education should work together to better promote career options** and awareness of the many different kinds of jobs available throughout the industry at any educational level.
4. **The best teachers this industry can ask for is for the experienced practitioner** to learn how to teach and go beyond the classroom to build trusted relationships with employers and industry associations.
5. **Career readiness, work ethic, fundamental skills and good citizenry are just as important as education and technical skills attainment.**

Many of these items can be taught in the classroom and many are taught on the job. What the industry is faced with most is that the students and apprentices are ready to enter the workforce and have the fundamental knowledge also have other options in competing occupations such as advanced manufacturing, cyber security and bio-medical fields. Construction offers something unique and that message needs to get out:

- ✓ Every day is different and no two projects alike.
- ✓ Efforts of people that work in construction are lasting and can have positive impacts on everyone else for years or decades.
- ✓ It is a career that uses as much brain as it does hands.

On-going Committee Work

The MCCEI will continue addressing these issues through its day-to-day operations and work through its committees:

Changing the Image of Construction and Talent Recruitment Committee
Devise and adapt industry promotional materials to attract and retain construction talent.

Alignment and Articulation Committee
Work with industry executives and education providers to open lines of communication, align program outputs with evolving industry demands and streamline education pathways through meaningful and relevant articulations.

Construction Management Deficit Committee
Work with post-secondary education providers to address a systemic deficit of four-year degree offerings, enrollments and graduates in Maryland to serve the construction and built environment industries.

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