

DVR Technology & Engineering Committee

Meeting 2 – Friday, November 14th, 2014

Topics: AutoCAD, Architecture, Engineering & Design

Meeting took place at Triton College

2000 Fifth Ave.

River Grove, IL 60171

T building Room T-164

In Attendance:

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Antigone	Sharris	Triton College	Faculty, Engineering	antigonesharris@triton.edu

Introductions - There was a brief introduction on all attendees at the meeting. We had a diverse representation of participants including grade schools, high schools, community college, and business partners who are in the Triton College district and/or currently employ interns from Triton College.

Updates - Engineering Technology Program gave the group an update and review of their program progress:

Antigone Sharris reviewed the Engineering Technology program materials given to the committee which included Triton youth summer programs and GADgET. The committee discussed the program offerings in Engineering Technology and the courses necessary for the AAS/Mechanical Design, AAS/Mechatronics, and ENT certificates. The committee also reviewed the Fall 2014 Schedule for Engineering Technology which included changes to the pre-requisite for ENT232 Descriptive Geometry and ENT260 Jig & Fixture courses.

Local Labor Market feedback What the companies all chimed in on that they are looking for –

Pros (what they do like and want):

- Community Service
- Recruiting process with young students
- Aptitude and ability to do the work
- Attitude
- Hand and eye skills
- Critical thinking skills
- How well they interact with the team
- Problem solving skills
- Engineering/Design Product development
- Realistic expectations
- Understanding of 3D space and how to make a product or part
- Basic grasp of physics and engineering principles
- Communication skills
- Personal relationships with the students

Cons (what they do not want or dislike):

Some students are not prepared for industry work

Opportunities in the workplace:

- Programming/Machine NC programming
- Internships/experience in the field are crucial to exposure to opportunities
- You learn by doing, also by failing

Education Updates/Feedback - Vocational and technical programs are important for the high schools, but are elective classes. Help educate the teachers to help create a path for their future and the opportunities that exist in manufacturing. Personal relationships with the teachers has made a big impact for companies.

Requirements for teachers in CTE and how to prepare them for technical education include 2,000 hours of field time. The math teachers are not equipped to solve the problems and so use to plugging in the formulas; the tech teachers are. Students have to take math as part of graduation requirements, however the tech classes are not required. Fundamentals need to change with math to more application and problem solving.

Initiatives that help breakout the traditional ways of teaching and learning in the high schools – PLTW, Geometry in Construction, and hands on application bring the connection between math and real world problem solving are needed.

Math is taught in other countries to be more practical base projects and use mathematics as a way of problem solving. The same approach used in the work force with end project as a goal and brainstorming to produce products. Frustration from teachers is that many of the experiences and work in the classroom are not practical for job sites. Strong requirements for the state in math, English, etc. to graduate hinders the learning process driven to meet a learning outcome that is not applicable to a job.

There is some progress coming through to make with project based math. Teachers need opportunities for them to go to companies and vice versa companies come to the school so teachers to can gain industry experience and professional development. Students benefit from teachers who have worked in the field and/or are working in the field. Teachers also need to go to industries and be in the companies taking on challenges of problem solving projects.

Companies can get involved via sponsorships and mentoring with innovative projects and competitions like the robotics team as it translate into skills necessary for real world jobs. One teacher uses Electude.com which helps students learn about math. Sharing lesson plans help from the community appreciation and respect for teachers that want to help students learn.

Bill Parks talked about the NFPA Fluid Power challenge program, typically done with student's two girls and two boys (8th grade) where they design and build a machine in a four hours. The students compete and document their work via a portfolio. Guest judges are welcomed. This type of activity focuses and fosters team building, brings people into engineering, and kids are driven to engage in areas of STEM long before they get to high school. If you would like to participate, the grant for schools is \$500 and Not-for-profits grants are \$3500.

One of the biggest challenges that companies have is how to make a thirty year investment in a young person, but you do not know if they will be able to keep up after changes in technology.

Not all schools have advocates for programs that will promote and nurture programs like FIRST. This is where your local community college can assist. The key for them is how to successfully support everyone from the school down to the companies with employees.

Idea possibility of a district wide industry funded where we find a way to stipend the teachers so that they do not choose between sports and education activities in and out of the classroom.

Opportunities should exist for teacher to have access to stipends, teacher industry experience in the field, job shadowing, etc.

Triton has expanded to include a Grants Department targeting the needs of grant funding. Grants through Triton Foundation is one way to provide funding outreach programs.

Finding students that come out with knowledge of construction and fabrication is challenging. Lab experience in the construction, fabrication techniques, pipe fitting, welding, combined, modeling, etc. (Hill).

Students can have book smarts and does not have an idea on how to work the machines. Continue to perpetuate that kids must have a 4 year school or nothing at all. There are jobs out there that do not require them to have a lot of schooling. Combination of internships, hands on, cooperative. Need to have both theory with the real experience (Internships and cooperative education provide this opportunity and diversity in the approach to knowledge.)

What's needed - Earn and Learn type of environment, how do we build work-study/cooperative type of program so that companies will have a long term investment? How do I balance with different companies (small and large)? Start at the high school level and then move from there (students gain exposure to manufacturing) Best place to learn is on the factory floor especially for machinist.

Some Kids still do not know what they want to do. There is an investment that they have to make to go through the training or educational programs.

Internships are good but there needs to be more of a realistic approach to work together small projects to start off then progress to more complicated projects/valuable task. 3 months is not enough time to challenge students in interns. Internships needs to be longer to be effective.

Work and school environment works the best but there needs to be flexibility with companies and the student's schedule. Lack of holistic understanding and approach to hiring students who are freshman and proven that they want to be there.

Companies are having a hard time donating equipment for the programs in the high schools. Frustrating for the schools from lack of funding. Partnerships between companies and schools are the way to go. High schools have gotten rid of many programs regarding learn by doing (shops). Graphic shops, machining, etc. are now gone from school programs. More college prep focused. Students need to hear

what opportunities that are out in the workplace is realistically. They hear things differently from teachers than they do from companies. Some manufacturing companies do not have a good mentoring system within their organization. There needs to be a formal weekly mentoring program to help students progress and understand their opportunities.

Some manufacturing companies do not have a strong communication system where students understand how manufacturing affects their future. Most manufacturers only use people in their company who are successful within their company. Focus is only on getting the project done not as an educational tool. The old school mentality of doing things the same way all the time needs to change.

People want stability and to feel like they are a part of something (valuable). Industry needs to understand that this needs to be communicated in both industry and in education. There seems to be a lack of motivation for students to want to go into career or technical fields. Thus, companies need to collaborate with high school to show/talk to them about how things are made and what they do.

SIU presented their program offering in manufacturing and industrial technology (lean process and six sigma). Companies with an aging workforce where 50% will be retiring with no younger talent that are skilled or have enough experience to replace these employees. Some manufacturing companies offer tuition reimbursement on a tiered structure, with some companies expecting a minimum of 3 years in return. If they leave before 3 years' service, employee needs to give the money back to the company.

High School Teacher Conclusion - At the end of the meeting DVR high school teachers met and discussed who would be available for a workshop June 22-25 on Algebra I in Material Products, Energy and Design - AMPED! This new contextual math and CTE course is being piloted this year at Loveland High School, using the GiC model. It covers all of the Algebra I Common Core standards and will allow students to design and create products through real-world, project-based lessons, labs and activities. Teachers would need a math partner to fully participate. Information was gathered on the students who will attend the Manufacturing Career Spotlight on Tuesday 11/18. Finally, it was noted that it would be great if the summer workplace experience had a manufacturing focus this year.