

# Summary of Workshop #2 Breakout Session

## October 30, 2020

### Why is there a need for new strategic initiatives in vacuum technology education?

1. **Because there is a need to find qualified candidates in the geographic areas where the companies are located as opposed to where the training programs might be located**
  - 1.1. Because community colleges traditionally only serve their regional market
    - 1.1.1. Because virtual programs provide a broader “reach” beyond a region - creates a deeper pool of students by reaching beyond the traditional service area
  - 1.2. Because hiring demand only in a regional market may not consistently drive sufficient enrollment levels that can sustain an educational program
    - 1.2.1. Because virtual programs can reach where the demand exists
2. **Because there is a need to broaden the “reach” of any marketing beyond traditional markets**
  - 2.1. Because potential students can be found in any geographic region
  - 2.2. Because potential students can be found among both incumbent workers and current high school students
  - 2.3. Because this would also help with enrollments
  - 2.4. Because this is an opportunity to expand and strengthen partnerships with related organizations
    - 2.4.1. Because this would allow the combination of benefits from different programs
3. **Because there is a demand for different types of credentials**
  - 3.1. Because industry is looking for skill credentials – community colleges traditionally focus on degrees and academic credentials
  - 3.2. Because there does not seem to be any recognized industry credentials for vacuum technology
  - 3.3. Because there is a need to be increasingly responsive to increasingly rapidly changing industry needs (e.g. technologies, markets)
4. **Because there is a demand for different types of delivery platforms**
  - 4.1. Virtual Programs - Because virtual programs better meet market demands
    - 4.1.1. Because virtual programs cut down on the need and expense of travel
    - 4.1.2. Because virtual programs better support shifting work schedules
  - 4.2. Because the COVID-19 pandemic has revealed a need for virtual learning options
  - 4.3. Because there is a need to be increasingly responsive to changing industry needs (e.g. technologies, markets)
5. **Because there is a demand for different types of delivery schedules**
  - 5.1. Because incumbent workers need schedules to also support their work schedule

### Why is there a need to review and refine curriculum?

1. **Because there is a need to incorporate more troubleshooting into existing programs**
  - 1.1. Because troubleshooting seminars are the most well attended within SVC
    - 1.1.1. Because improved troubleshooting skills would improve workforce quality
  - 1.2. Because a lack of troubleshooting skills requires more workers to resolve a problem

- 1.2.1. Because new workers are often in an “apprenticeship” relationship with experienced workers
- 1.2.2. Because more experienced workers have developed skills by working with equipment not available in the classroom
- 2. **Because there is a need to incorporate “soft skills” into a technical program**
  - 2.1. These would need to be identified and validated by industry
    - 2.1.1. teamwork skills, communication (written and oral) skills, and critical thinking skills
    - 2.1.2. career development skills, such as how to look for a position, writing a resume, and how to interview
- 3. **Because students would benefit from exposure to broader applications of the technology**
  - 3.1. Note: Three types of relevant processes
    - 3.1.1. Add material – deposition
    - 3.1.2. Remove material – etching
    - 3.1.3. Chemically modify material
  - 3.2. Because integration of vac tech with advanced manufacturing exists in industry
    - 3.2.1. Because this broadens the type of student target for the program
- 4. **Because students would benefit from integration of other related technologies**
  - 4.1. Because vacuum technology is used in conjunction with robotics, PLC and mechanical automation
    - 4.1.1. Because this broadens the type of student targeted for the program
- 5. **Because semiconductor manufacturing incorporates several processes enabled by vacuum technology**
  - 5.1. Core semiconductor manufacturing processes
    - 5.1.1. Modifying electrical properties – ion implantation, vapor diffusion
    - 5.1.2. Patterning – transfer feature shapes onto surface
    - 5.1.3. Add material – deposition
    - 5.1.4. Remove material – etching
  - 5.2. Surface characterization techniques
    - 5.2.1. Scanning Electron Microscope
- 6. **Because there is an opportunity to integrate NCC courses with other industry short courses**
- 7. **Because there may be industry standards developed in the future that would need to be supported**

Why is there a need to explore issues related to enrollment in vacuum technology programs?

- 1. **Because state funding for community colleges is tied to enrollments**
  - 1.1. Because state funding is usually tied to FTE’s
- 2. **Because of the high capital costs of lab courses like vacuum technology impacts the cost per student ratio**
- 3. **Because all students who start a program do not finish (retention and completion rates)**
  - 3.1. Because employers encourage enrollment but students are not always as committed to finishing (or even know they are enrolled)– they enrolled because they were required to but may not have sufficient incentive to finish

- 3.1.1. Because employers may not understand how a single course fits into a larger credential program
- 3.2. Because available time or schedule may not support completion
- 4. **Because potential students are not aware of the benefits of developing skills in vacuum technology**
  - 4.1. Because they have not heard about the program
  - 4.2. Because they do not understand the technology and what industry sectors use it
  - 4.3. Because they are not aware of the career opportunities
  - 4.4. Because the program “pitch” is not strong, consistent or even exists
- 5. **Because enrollment levels in the program must reach sustainable levels for a college to justify efforts needed to support on-going offering of the program**
- 6. **Because there are differences between “visiting” (non-credential seeking) and “regular” students**

## Why is there a need to explore the issue of resources to support vacuum technology programs?

- 1. **Because lab equipment, learning kits and telepresence technology contribute to a high capital cost for programs like vacuum technology**
  - 1.1. Community college funding is tied to FTE’s and cost per student
  - 1.2. Budget reductions often impact these programs first because of the cost per student
  - 1.3. Cost of changing telepresence technology both for deliverer and receiver (devices and broadband access)
- 2. **Because the cost of identifying and onboarding new faculty from industry is high**
  - 2.1. Because faculty need experience and a broad background in the technology
  - 2.2. Because faculty also need academic credentials
  - 2.3. Because qualified instructors can often make more money in industry
  - 2.4. Because professional development for existing faculty is more difficult to get and expensive
    - 2.4.1. Professional development funding for faculty is almost non-existent
- 3. **Because incorporating more troubleshooting into the program curriculum requires more hands-on activities and lab exercises**
- 4. **Because identifying and onboarding qualified lab assistant is a challenge**
  - 4.1. Lab assistant needs experience in the technology
  - 4.2. Lab assistant position is part-time
  - 4.3. Lab assistant position pay not competitive with other employment opportunities
- 5. **Because procuring, building, and supporting equipment resources is a challenge**
  - 5.1. Cost of equipment
  - 5.2. Procurement time
  - 5.3. Maintenance and storage
- 6. **Because there is a need to develop programs that can be scaled**
  - 6.1. Because availability and access to lab equipment is an issue
  - 6.2. Because lab and hands-on classes have unique issues with class size
- 7. **Because resources for marketing and outreach by community colleges are limited**
  - 7.1.1. Because marketing to industry is different from marketing to employees and marketing to high school – more target markets require more resources

**8. Because technology programs like vacuum technology need a strong program champion to manage and drive growth and to support students**

8.1. Because program chairs for technology programs have different responsibilities than academic program chairs

8.1.1. Because there is a need to support on-going communications channel between industries and contact(s) at the college

8.2. Student support needs include

8.2.1. Employment opportunities and job search

8.2.2. Industry contacts and relationships