

# Shaping the Future of Vacuum Technology Education

## WORKSHOP #2: PROFESSIONAL SOCIETY PERSPECTIVE



OCTOBER 30, 2020

This work was made possible in part by a grant from the  
**National Science Foundation** (ATE DUE #1700624)



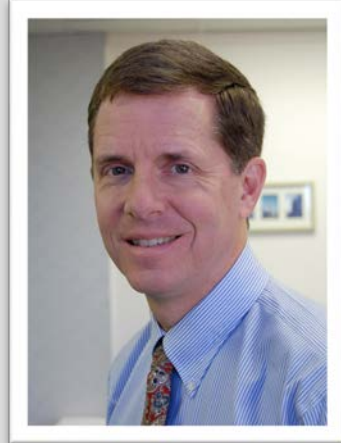


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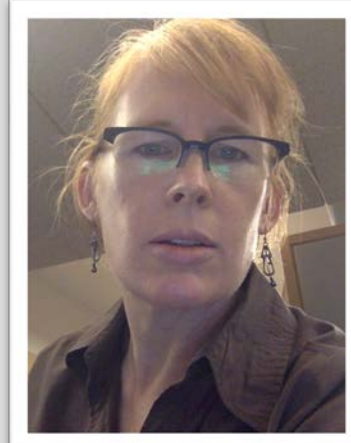
# Workshop Organizers



**Nancy Louwagie**  
*Principal*  
*Investigator*  
DELIVER Project



**Bob Bailey**  
*Outcomes*  
*Consulting Services,*  
*External Evaluator*  
DELIVER Project



**Sarah Holsted**  
*Communications*  
*Specialist*  
DELIVER Project

**With gratitude for the support of  
the administration of  
Normandale Community College  
and the DELIVER Project team.**

**Cary Komoto**, Dean  
Science, Technology, Engineering,  
Math and Education Division

**Tom Johnson**, Co-PI

**Dr. Ruth Robinson**, Co-PI

**John Lasswell**, Instructor

**Dr. Angela Foudray**, Instructor

**Rand Whillock**, Instructor

**Steve Osell**, Lab Assistant

**Cindy Zoul**, Project Manager

**Tim Lapanne**, Student Services

# DELIVER Project Team @ Normandale



**Nancy Louwagie**  
Program Chair,  
Intro to Vac Tech,  
PI, DELIVER



**Dr. Ruth Robinson**  
CHEM faculty,  
VACT instructor,  
co-PI, DELIVER



**Tom Johnson**  
VACT instructor,  
co-PI, DELIVER



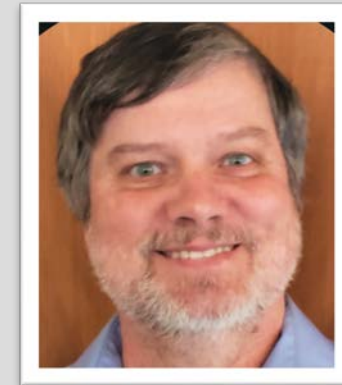
**Dr. Angela Foudray**  
PHYS and ENGR instructor,  
VACT instructor,  
Sr Personnel, DELIVER



**John Lasswell**  
VACT Instructor,  
Sr Personnel, DELIVER



**Steve Osell**  
VACT Lab Assistant



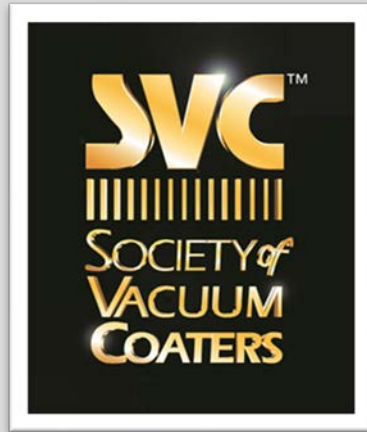
**Rand Whillock**  
VACT automation instructor,  
Sr Personnel, DELIVER



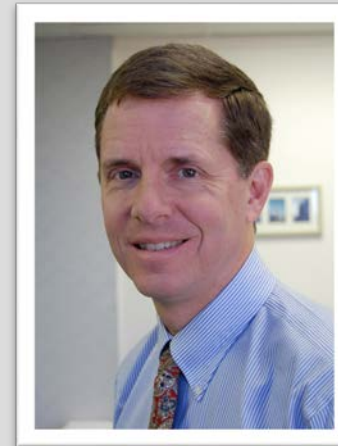


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# Workshop 2 Presenters



*Education Director*  
Society of Vacuum  
Coaters (SVC)



**Bob Bailey**  
Outcomes Consulting Services  
External Evaluator  
DELIVER Project

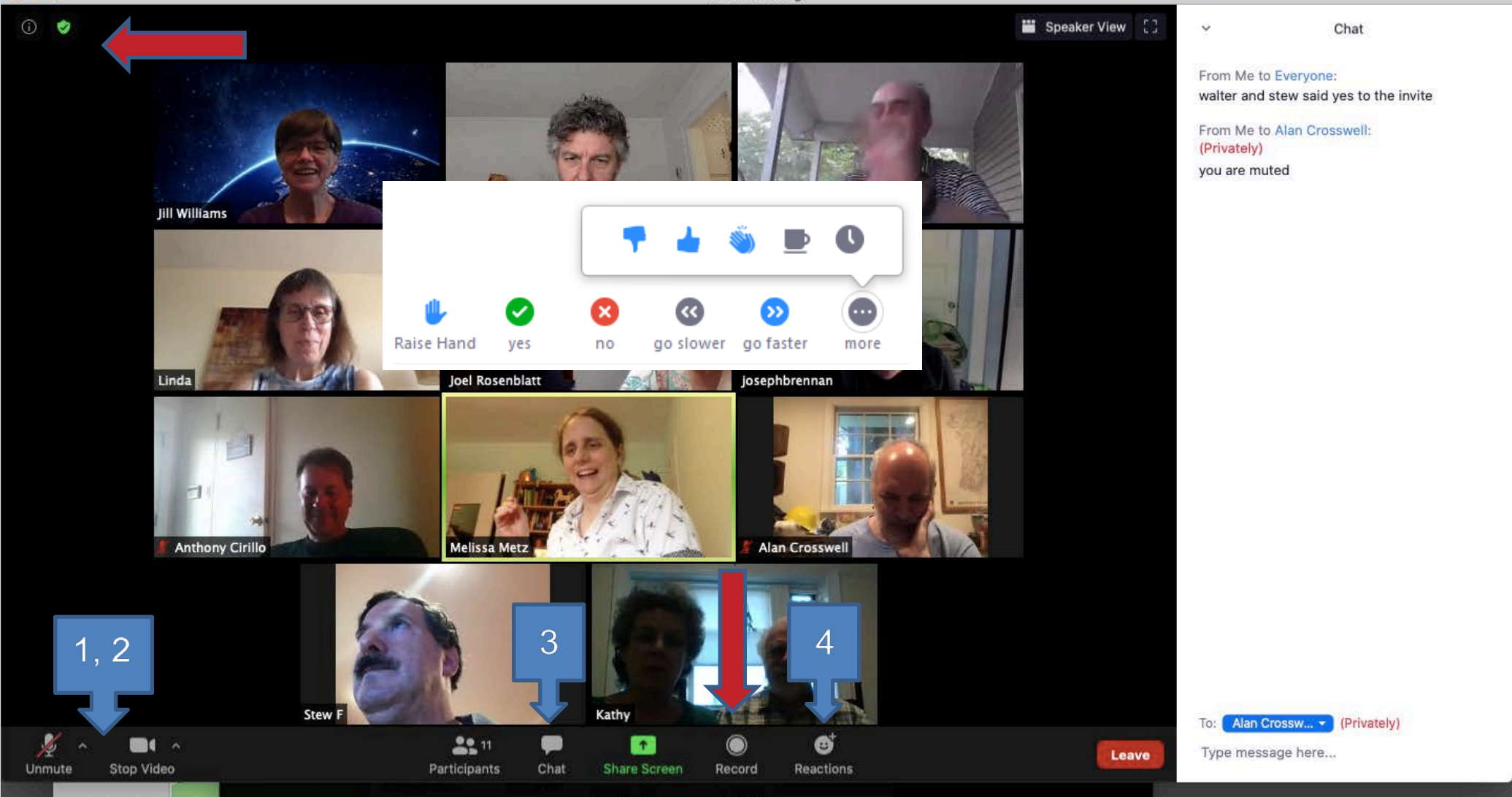


**Dr. Angela Foudray**  
PHYS and ENGR instructor,  
VACT instructor,  
Sr Personnel, DELIVER



**Nancy Louwagie**  
Program Chair  
Intro to Vacuum Tech  
PI, DELIVER

# Orientation



Zoom meeting

Speaker View

Chat

From Me to Everyone:  
walter and stew said yes to the invite

From Me to Alan Crosswell:  
(Privately)  
you are muted

1, 2

3

4

Unmute Stop Video Participants 11 Chat Share Screen Record Reactions Leave

Raise Hand yes no go slower go faster more

To: Alan Crossw... (Privately)  
Type message here...

## Control features

- 1) Mute
- 2) Camera
- 3) Chat
- 4) Raise Hand-> Reactions

## Process

- Summary in chat box
- Raise hand and / or chat
- Q&A breaks



# Shaping the Future of Vacuum Technology Education

WORKSHOP #2:  
PROFESSIONAL SOCIETY PERSPECTIVE

## Introduction: About the Workshop Series

OCTOBER 30, 2020



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# Workshop Series Agenda and Objectives

## Past

- Provide history and context
- REVAMP and DELIVER Projects at Normandale
  - Results
  - Impact

## Present

- Map the current state of vacuum technology in the U.S.
  - Identification of gaps
  - Industry perspective
  - Student perspective
  - Demonstrations of current practice

## Future

- Plan for growing and sustaining the program
  - Identification of opportunities and needs
  - Identification of sectors
  - Brainstorm



# Shaping the Future of Vacuum Technology 2020-2021 Workshop Series

*Session 1* | Technical  
Program  
Perspective

*Session 2* | Professional  
Society  
Perspective

*Session 3* | Industry and  
R&D  
Perspective

*Session 4* | Student  
Perspective

*Session 5* | Summary of  
Key  
Findings  
Final Report



# Independent Assignments

## *Assignment 1*

### Gap Analysis

- Identify gaps as opportunities for growth

## *Assignment 2*

### Impact Analysis

- Impact of past activities and desired impact for future activities

## *Assignment 3*

### Brainstorming

- Use collective experience of this group to identify potential strategies and opportunities

# Workshop Series Timeline

Session 1	• September 24
Assignment 1 – Gap Analysis	• Due back October 8 - 2 weeks after session 1
Session 2	• <b>October 30</b>
Assignment 2 – Gap Analysis	• Due back November 13 - 2 weeks after session 2
Session 3	• Nov 30 – Dec 11
Assignment 3 - Survey	• Due 2 weeks after session 3
Session 4 – Student Panel	• Jan 19 – Jan 29, 2021
Prep for Session 5	• 1 week prior to session 5
Session 5 – Wrap Up	• March 1-5 or March 15-19, 2021
Final Report	• Early April 2021

# Series Deliverables

<https://www.normandale.edu/departments/stem-and-education/vacuum-and-thin-film-technology/shaping-the-future-of-vacuum-technology-education>

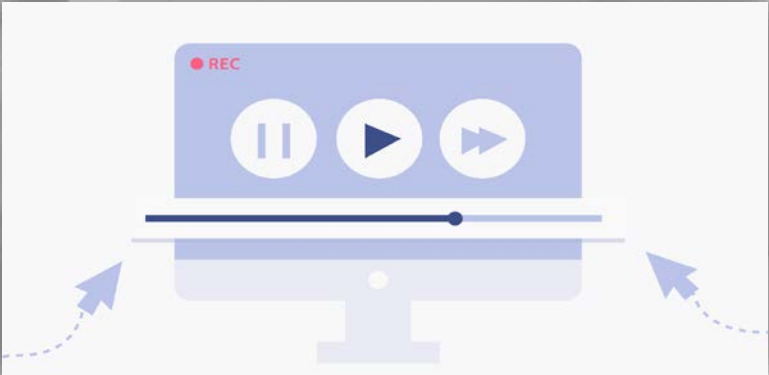
Participant List  
Disaster Risk Reduction Practitioners Workshop  
Bangkok, 13-14 November 2019

No.	Name	Position	Organization	Country (if not)	Email
<b>Part 1: National Societies (South East Asia)</b>					
1	Mr. Ruchira Prasad	Director of Program Operations	National Society (South East Asia)	USA	ruchira.p@nso.org
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Participant List



Slides



Recording



Final Report





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# Q&A Break





# Shaping the Future of Vacuum Technology Education

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## The State of Vacuum Education - SVC

OCTOBER 30, 2020



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# Education from a Professional Society Perspective

Scott Walton, PhD  
SVC Director of Education



Shaping the Future of Vacuum Technology Education Workshop  
Normandale Community College  
October 30, 2020



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# Q&A Break





# Shaping the Future of Vacuum Technology Education

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## Summary of Gap Analysis & Discussion

OCTOBER 30, 2020

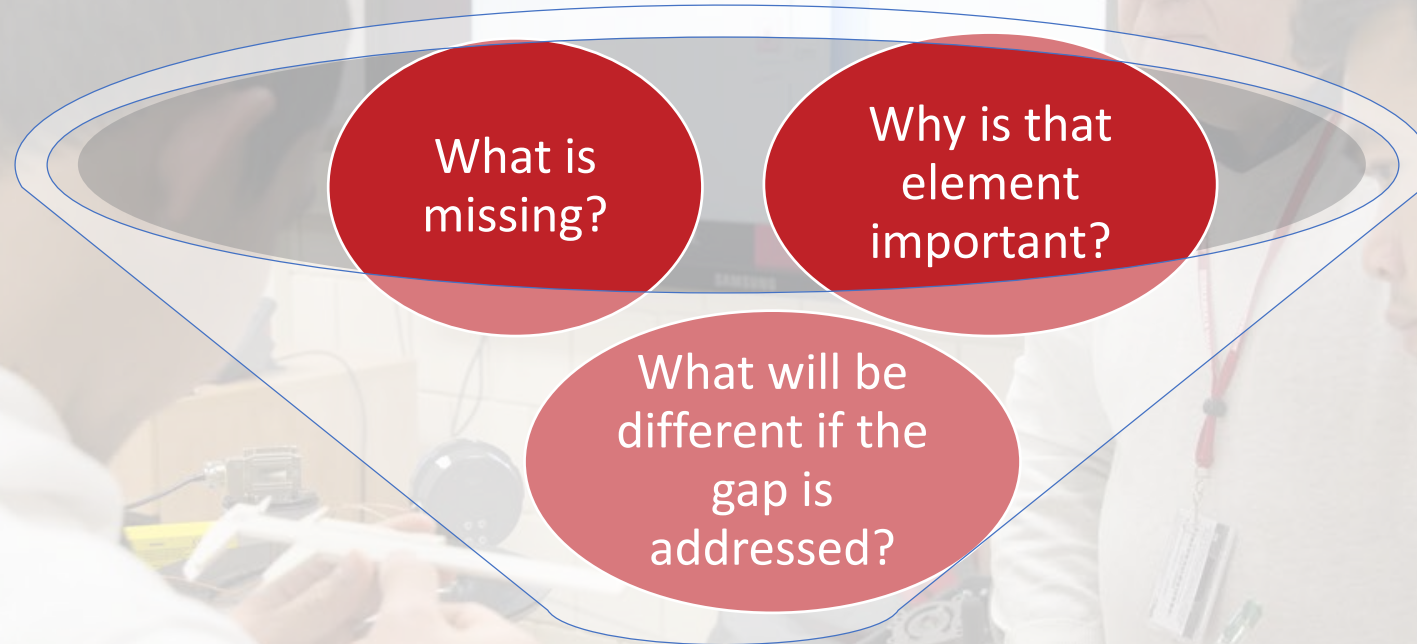


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# Gap Analysis Assignment



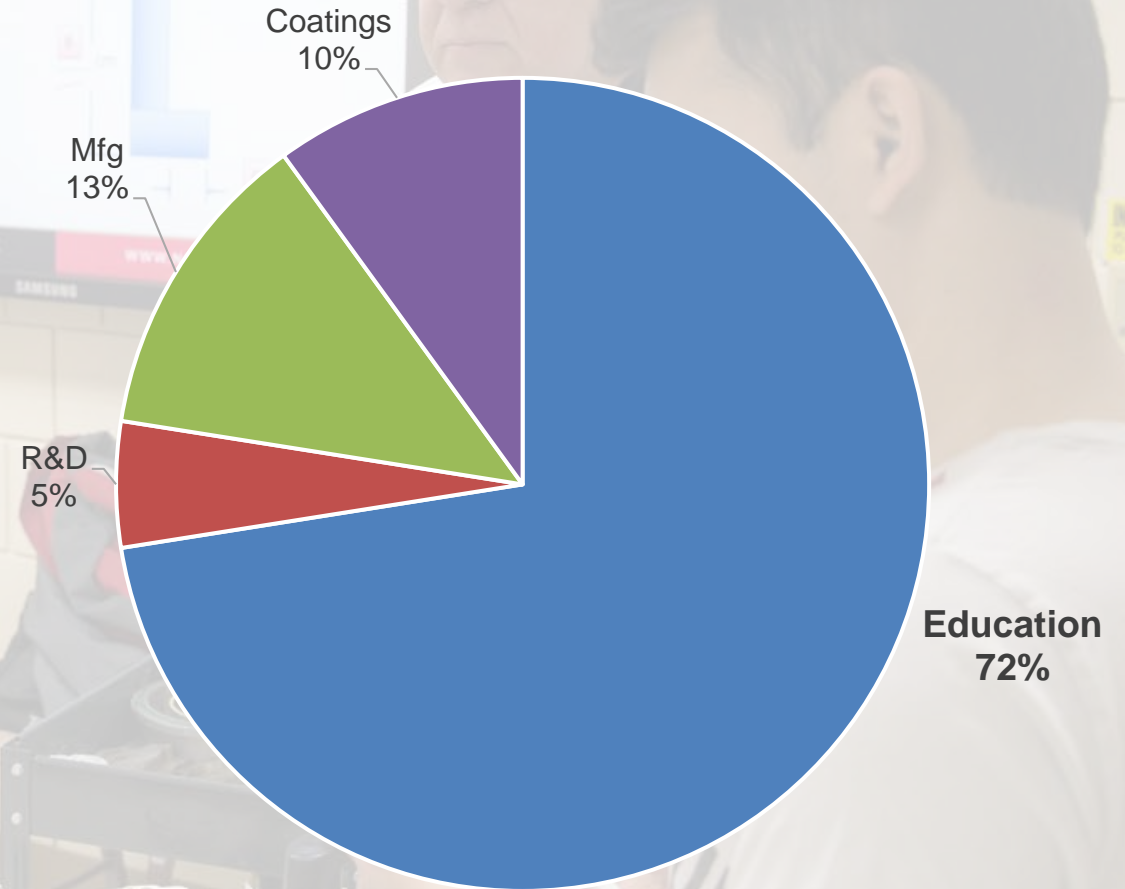
**Growth and Sustainability of Vacuum  
Technology Programs**





# Gap Analysis Data

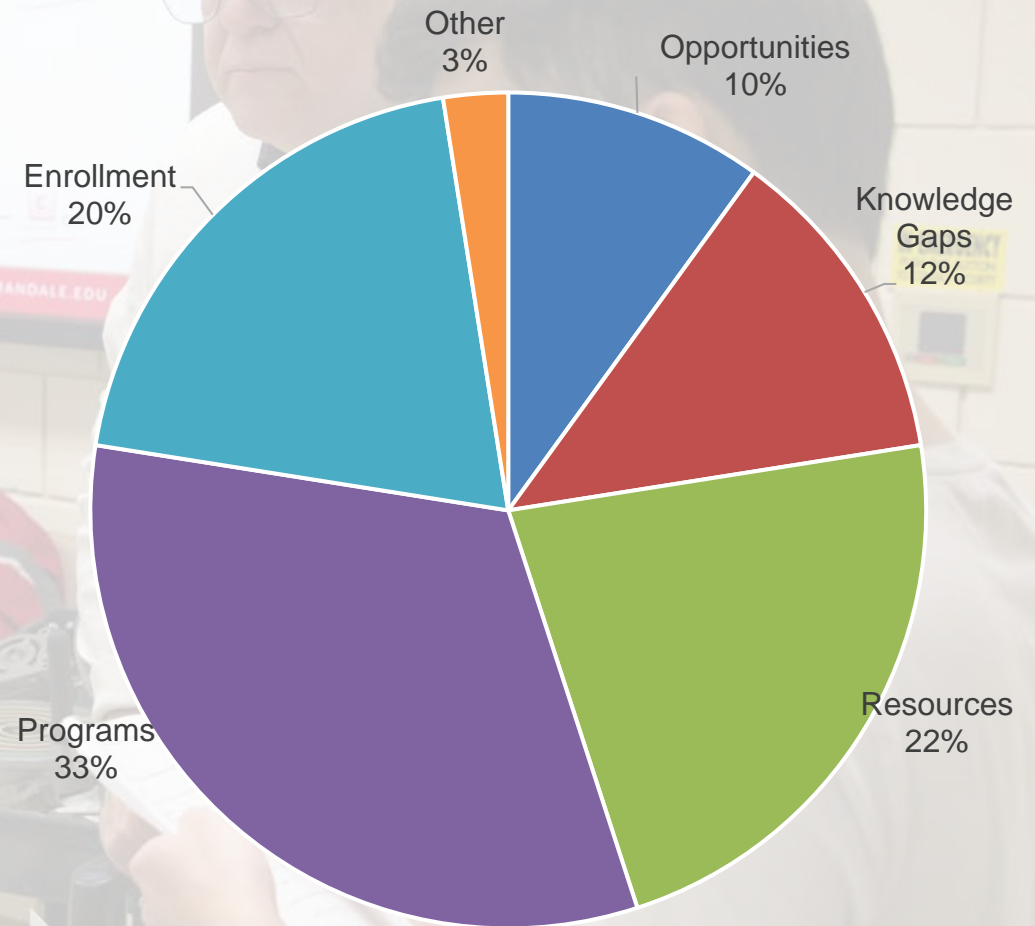
- Nine (9) worksheets
- Normandale SWOT Analysis June 2018
- Forty-two (42) gaps identified
- Education sector is the dominant contributor





# Organization of Responses

- 1) Programs – marketing, new credentials
- 2) Resources – funding, instructors, industry support, advocacy
- 3) Curriculum – topics, skills, standards
- 4) Enrollment – numbers, target student readiness
- 5) Opportunities – partnerships, collaboration, new markets







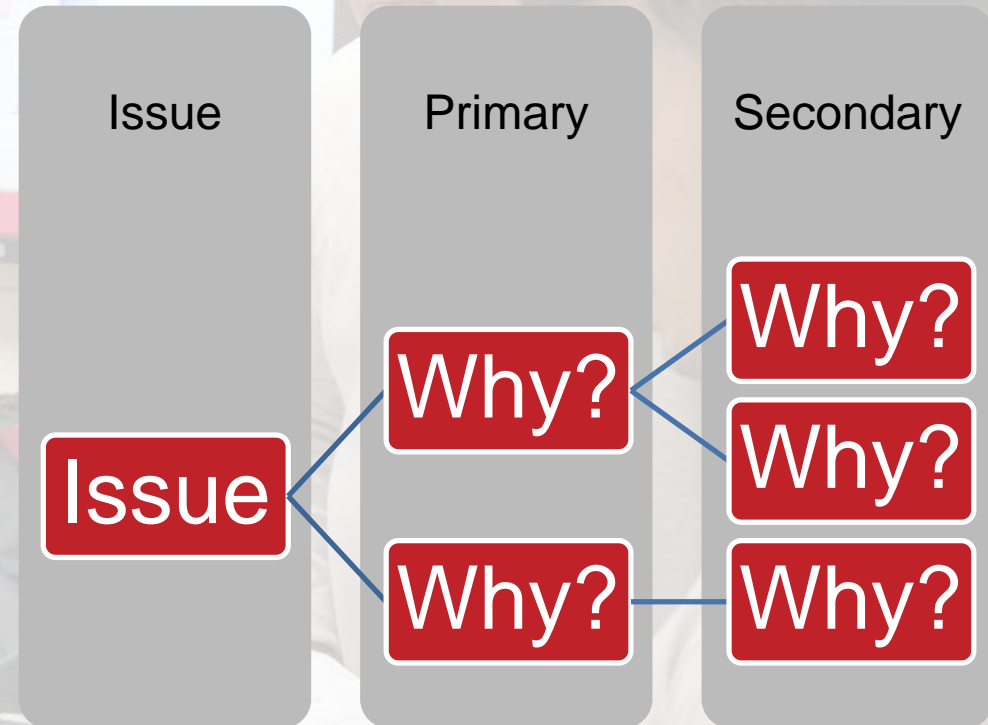
Enrollment	Curriculum	Resources	Programs	Opportunities
Current levels do not meet workforce demands	Troubleshooting and problem solving	Budget allocations for lab equipment	Short courses to promote the technology	Collaboration with other colleges and universities
Not attracting “traditional” students (age 18–24 AND not already working in the field.)	Applied technology focused on skill development versus academic knowledge	Difficult to find qualified instructors with the broad background and credentials needed	Microcredentials and certificates	Off shoring of semiconductor manufacturing – national security issue
Low enrollment increases program vulnerability to budget cuts	Incorporating electronics and automation principles	Advocacy at state and federal levels (support funding)	Expand distributed learning; e.g. time zone differences for distributed learning	Industry partnerships
	Introduce and discuss applications beyond just semiconductor mfg.	Dependence on program champions	Develop industry skill standards	Collaborate with Professional societies
			Marketing	



# Breakout Session – Issue Tree

- There are two basic kinds of issue trees:

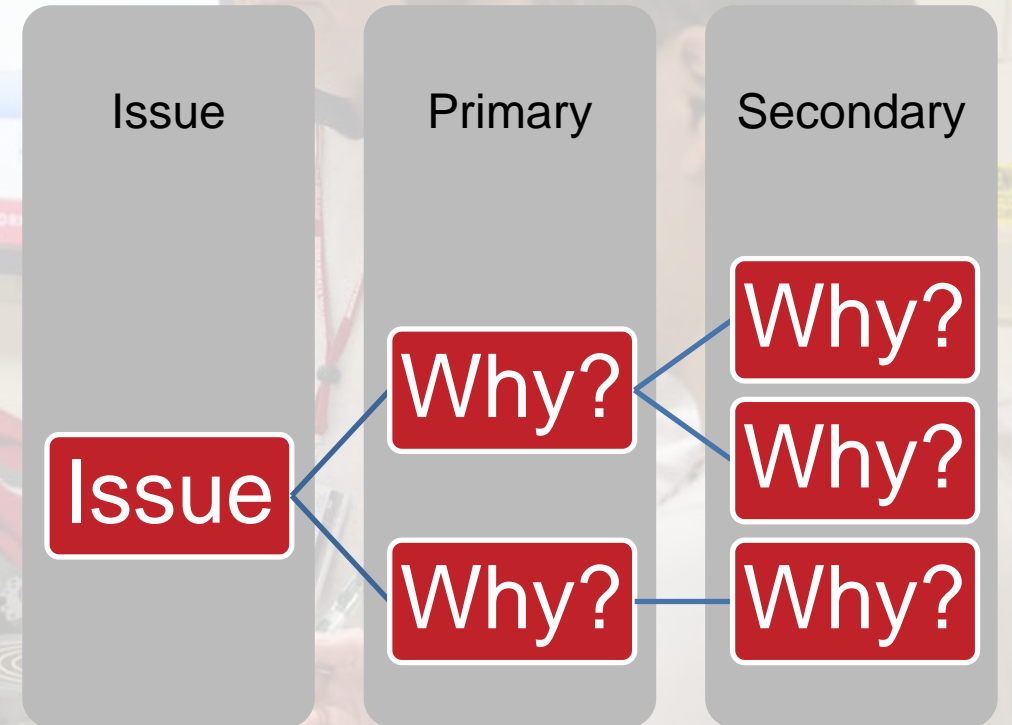
- Today: Problem trees (also known as Hypothesis trees – created by answering "Why?"
- Later: Solution trees – created by answering "How?"





# Basic Principles – Issue Tree

- 1) For the assigned issue, use the summary table to identify and list in outline form the reasons why the issue is a concern
- 2) Continue to further breakdown the reasons by identifying secondary, tertiary and beyond levels of “whys”.
- 3) Use the MECE principle: mutually exclusive, collectively exhaustive.
  - a. Mutually exclusive means there is no overlap between different parts of the tree.
  - b. Collectively exhaustive means they cover the whole problem.
- 4) Do not go into the small details (specific hypotheses): focus on capturing the broad categories that make up the problem.
- 5) Deliverable is an outline of reasons for the issue







## Example - Issue Tree

- 1) Issue: Curriculum
  - A. Primary “Why?” – *add more troubleshooting to curriculum*
    - i. Secondary “Why?”: *Reduces dependence on other experienced techs*
    - ii. Secondary “Why?”: *Technicians still lack problem solving techniques*
  - B. Primary “Why?”: *Programs need to focus more on technicians as opposed to academic*
    - i. Secondary “Why?”: *Some general ed courses may not be relevant*
      - a) Tertiary “Why?”: *Academic degrees require general education courses*





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# Breakout Discussions





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# Report Out

In one sentence, what was the theme or takeaway from your group's discussion?



# Shaping the Future of Vacuum Technology Education

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**Hands-on Demo: Rough Vacuum Equipment Trainer  
& Intro to Vacuum Technology**

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# Q&A Break







# Next Steps

- Today: Complete the end-of-workshop survey: <https://www.surveymonkey.com/r/D75NQV3>
- Next week: Expect an e-mail from Normandale with
  - Link to end-of-workshop survey
  - Link to poll for dates for workshop session #3
  - Reminder: Request for participant bio for list
  - Attachment: Issue Tree document
  - Attachment: Instructions for application for stipend
  - Link to workshop website at Normandale  
<https://www.normandale.edu/departments/stem-and-education/vacuum-and-thin-film-technology/shaping-the-future-of-vacuum-technology-education>
- By Nov 13:
  - Made additions to the Issue Tree and return to Bob Bailey
  - Complete the poll for workshop session #3: Friday - Dec 4 or 11 ?  
[https://doodle.com/poll/d94ik97nqhaibssw?utm\\_source=poll&utm\\_medium=link](https://doodle.com/poll/d94ik97nqhaibssw?utm_source=poll&utm_medium=link)





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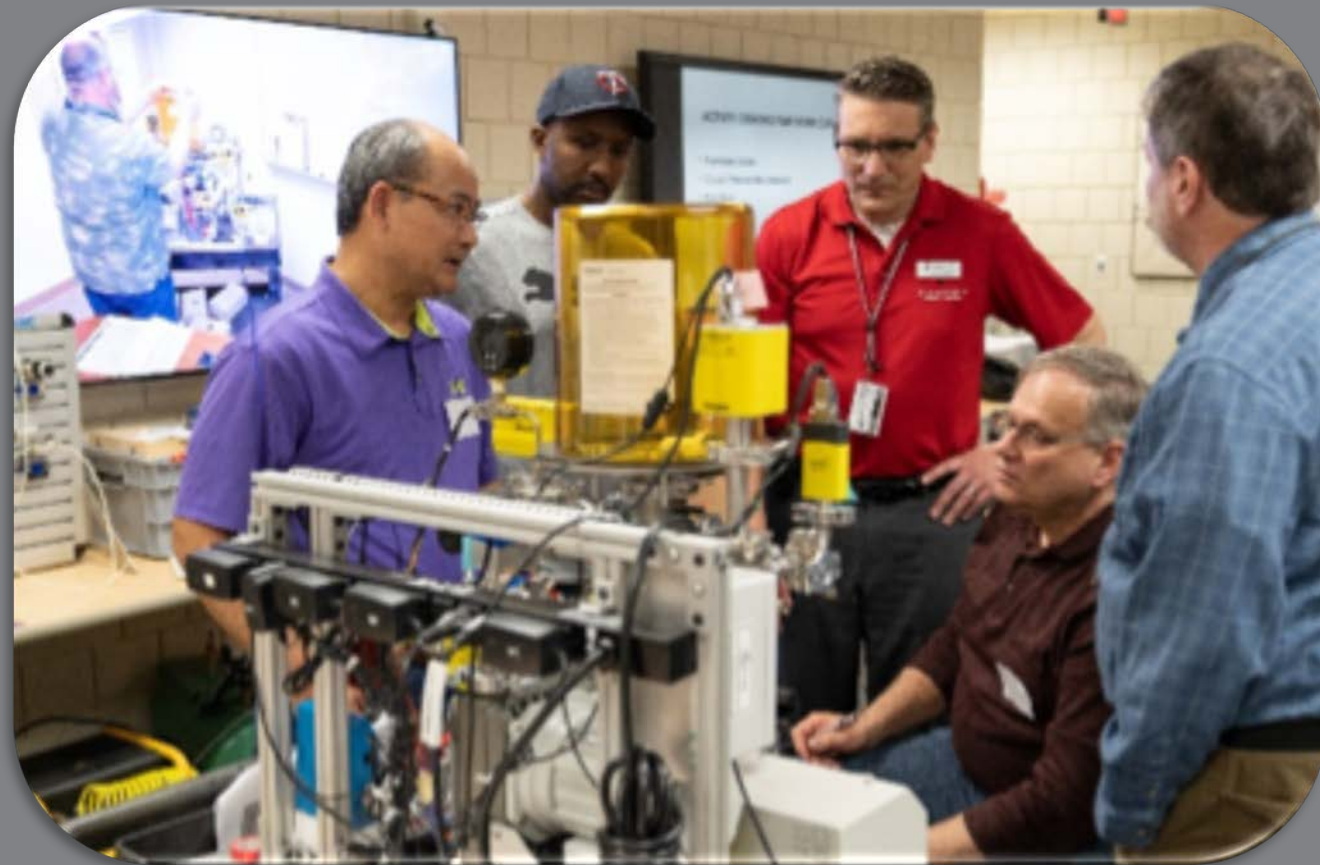


# Shaping the Future of Vacuum Technology Education

## **WORKSHOP #3: INDUSTRY AND R&D PERSPECTIVE**

# THANK YOU!!!

**DATE TBD: DEC 4 OR 11, 2020**



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