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Shaping the Future of Vacuum Technology Education

WORKSHOP #3: INDUSTRY AND R&D PERSPECTIVE

DECEMBER 11, 2020

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

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Workshop Series Timeline

Session 1	• September 24, 2020
Assignment 1 – Gap Analysis	• Due back October 8
Session 2	• October 30, 2020
Assignment 2 – Gap Analysis	• Due back November 13
Session 3	• **December 11, 2020**
Assignment 3 – Q&A	• Due 2 weeks after session 3
Session 4 – Student Panel	• Jan 29, 2021, 1-2pm CT
Prep for Session 5	• 1 week before session 5
Session 5 – Wrap Up	• March 1-5 or March 15-19, 2021
Final Report	• Early April 2021

Thank you, NSF

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Thank you, Normandale



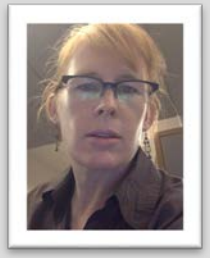




With gratitude for the support of the administration of Normandale Community College and the DELIVER Project team.

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

Workshop Organizers
Nancy Louwagie
Bob Bailey
Sarah Holsted

DELIVER Project Team @ Normandale

Nancy Louwagie, PI; Program Chair, Intro to Vac Tec
Tom Johnson, Co-PI; VACT Instructor
Dr. Ruth Robinson, Co-PI; CHEM faculty, VACT instructor
John Lasswell, Sr. Personnel; VACT Instructor
Dr. Angela Foudray, Sr. Personnel; PHYS, ENGR, VACT Instructor
Rand Whillock, Sr. Personnel; VACT Automation Instructor
Steve Osell, Lab Assistant
Cindy Zoul, Grants Development Specialist
Tim Lapanne, Kim Klein, Student Services
Bob Bailey, External Evaluator, Outcomes Consulting Services
Sarah Holsted, Communications Specialist

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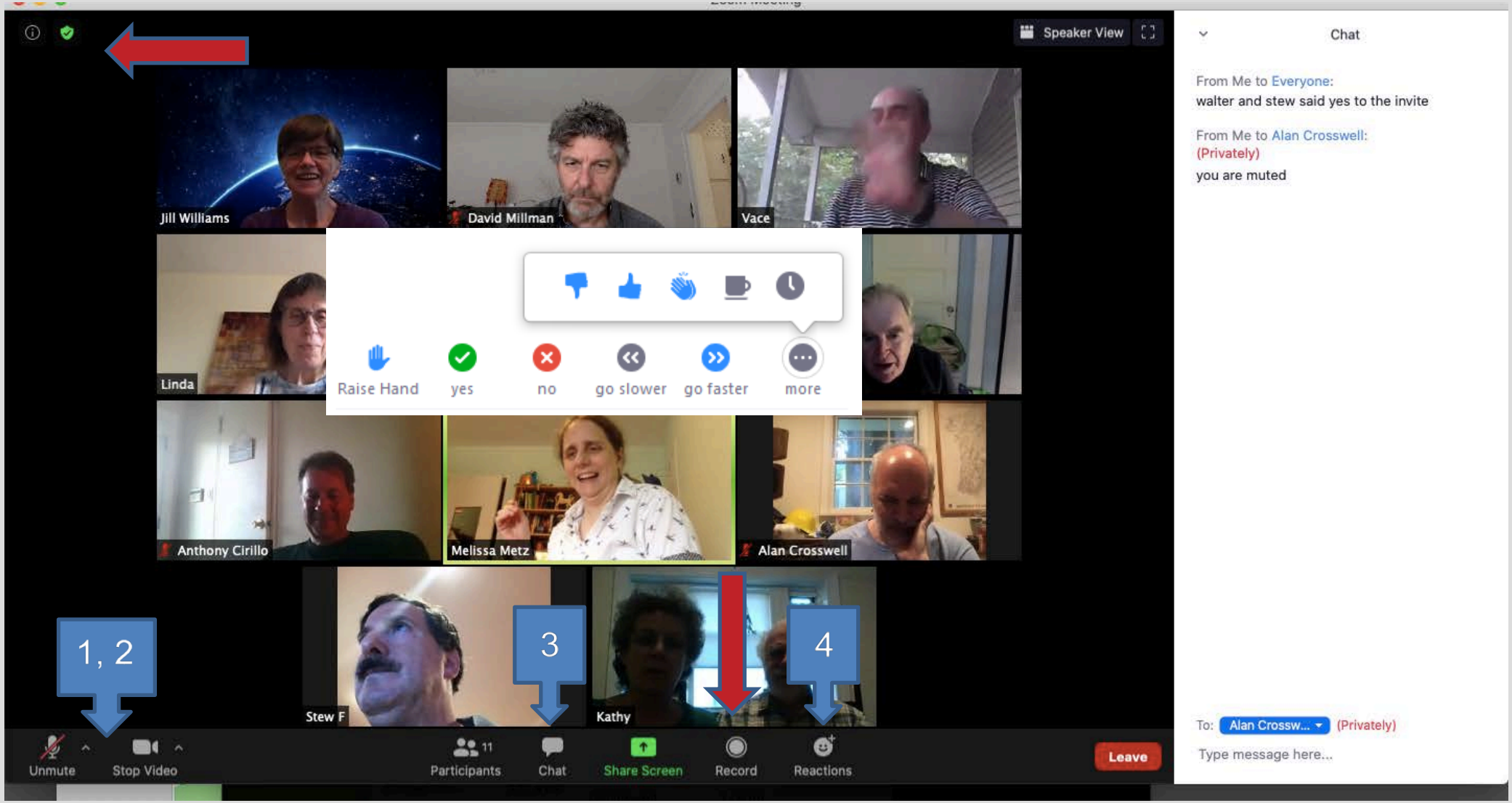
Technology Orientation



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

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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

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Present: Map the current state of vacuum technology education in the U.S.

Identify Gaps

- Assignment 1: Gap Analysis on Vacuum Tech Education
- Session 2: Develop Issue Trees
- **Session 3: Review Issue Tree Summary**
- Session 4: Student panel discussion
- Session 5: Develop Solution Tree

Industry Perspective

- Spring 2020: Industry survey
- Session 2: Society of Vacuum Coaters presentation
- **Session 3: Review report from industry survey; Industry and R&D panel discussion**
- Assignment 3: Complete Q&A, writing assignment

Demo of Current Practice

- Session 1: Overview of Anywhere Technical Education Classroom & Foundations of Vacuum Tech (VACT 1010)
- Session 2: Intro to Vac Tech (VACT 1292) & Rough Vacuum Equipment Trainer system
- **Session 3: Thin Film Deposition (VACT 2297) & Remotely operated deposition system**
- Session 4: Vacuum Analysis & Troubleshooting (VACT 2293) & High Vacuum Equipment Trainer system

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Hands-on Demo: Remotely-operated Deposition System & Thin Film Deposition

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The State of Vacuum Technology Education @ Work

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Workshop 3 Panelists

Mike Diedrich
Plant Manager
Texas

Randy Pico
Engineering Directorate
Senior Superintendent
California

John Albachten
Senior Engineering
Services Manager
Minnesota

Nancy Louwagie – Panel Moderator
PI, Project DELIVER
Normandale Community College
Minnesota

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How do you select and prepare the people in your organization who develop in-house training programs or provide in-house training?

Survey Question: What type of education and/or training opportunities does your organization currently provide or support for employees who are responsible for maintaining and troubleshooting vacuum systems?

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Q&A Break

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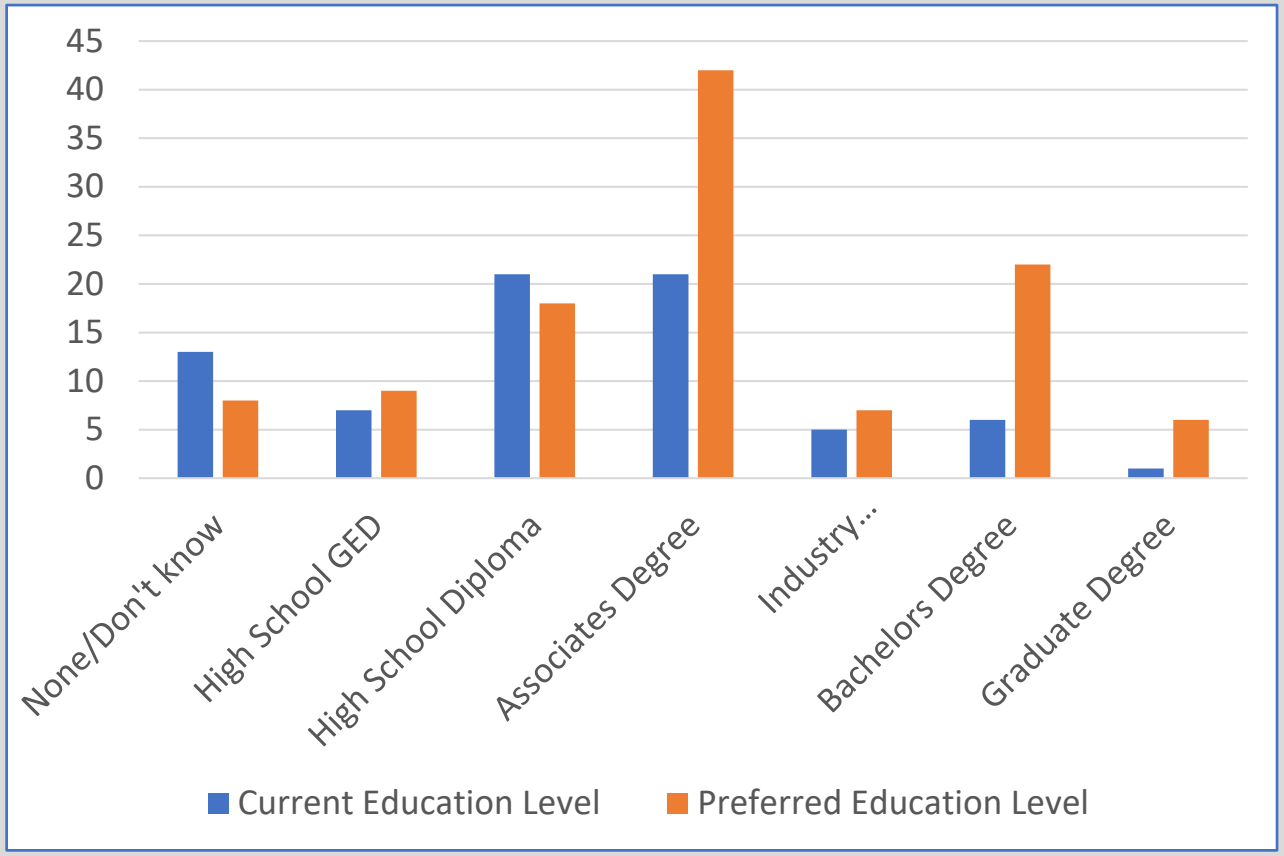
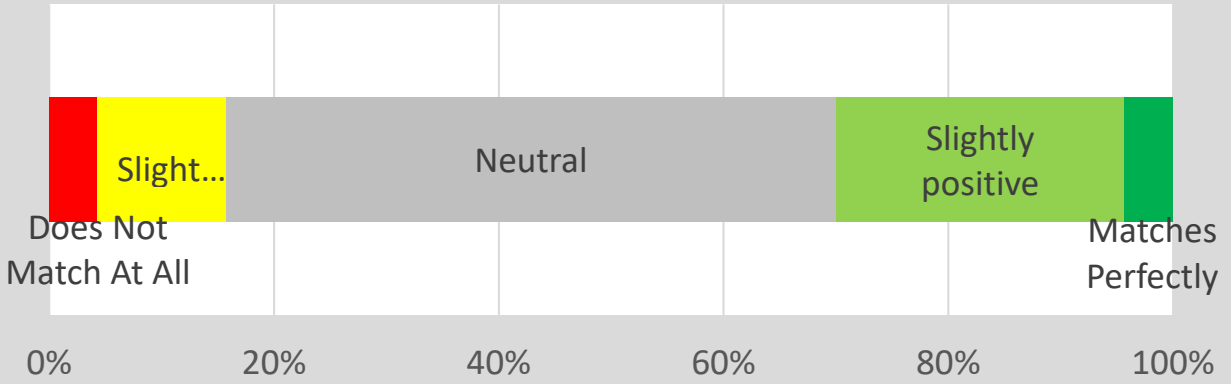
Breakout Discussions

Are these findings reflected at your organization? What reasons might explain this difference?

There is a clear preference for more formal education credentials (especially Associate and Bachelor degrees) for entry-level technicians working with vacuum systems.



Over 80% of the survey responses indicated that the actual skill level of technicians compared to the current skill level **was not** an issue.



Survey Question: What is the minimum education level required by your organization for entry level technicians hired to work with vacuum processes and equipment?

What education level should technicians have to be effective in your organization?

Survey Question: How closely does the actual skill level of the technicians in your organization match the preferred skill level in the area of vacuum processes and equipment?

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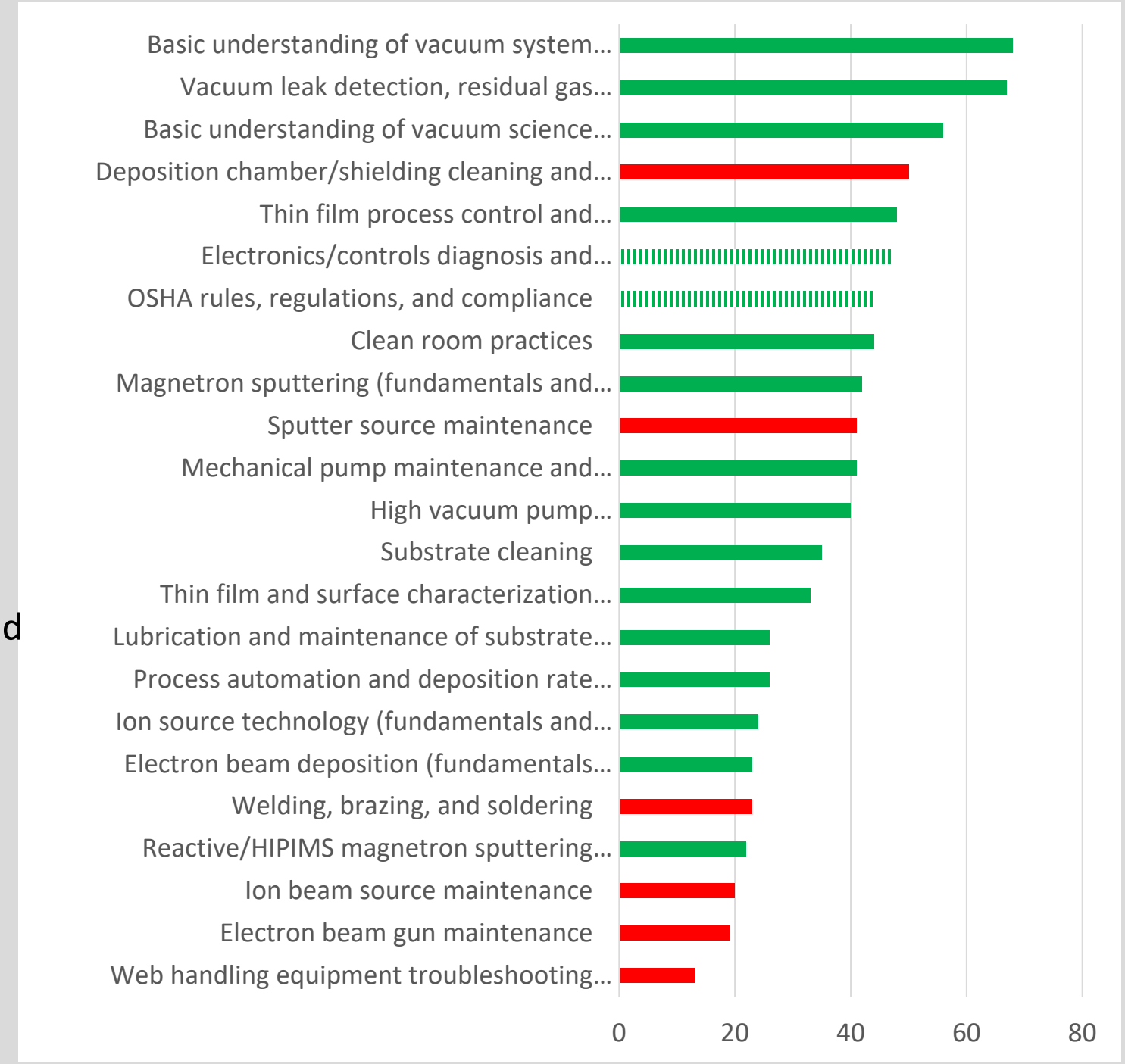
For content not covered in Normandale's Vac Tech program: 1) who should develop / deliver? 2) How should the content be delivered: academic program; short course?

- Green – topic covered in Normandale's VACT program
- Green pattern – topic covered in other related Normandale courses
- Red – topic currently not covered in Normandale's VACT curriculum

Survey Question: Identify the vacuum technology topics that you feel are critical for technicians working at your organization to know and understand in order to be successful in their jobs.



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Report Out

In 2-3 sentences, summarize your group's response about preferred education levels for technicians.

Next Steps

- Today: Complete the end-of-workshop survey: https://www.surveymonkey.com/r/2ZJQ8YR
- Next week: Expect an e-mail from Normandale with
  - Link to end-of-workshop survey
  - Attachment: Assignment 3
  - 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 December 18, 2020 (to receive payment in 2020):
  - Return Assignment 3 to Bob Bailey
  - Complete all details for the stipend application
- By December 23, 2020 (to receive payment in 2021):
  - Return Assignment 3 to Bob Bailey

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NSF Acknowledgement

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WORKSHOP #4: STUDENT PERSPECTIVE

THANK YOU!!!

JANUARY 29, 2021, 1:00 – 2:00 CT

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