# THE RUCKS GROUP LLC

# ADVANCED TECHNOLOGICAL EDUCATION NETWORK FOR UTILITIES AND ENERGY TECHNICAL EDUCATION (UTILITIES AND ENERGY COORDINATION NETWORK) TELECOMMUNICATIONS SURVEY RESULTS REPORT

**Prepared for:**

Amy L. Kox, Ed.D.
Northeast Wisconsin Technical College
2740 W. Mason St.
Green Bay, WI 54307

**Prepared by:**

Kathleen Lis Dean, Ph.D.
Alyssa Hokky, P.S.M.
Julia Siwierka, Ph.D.
The Rucks Group, LLC
130 W. Second Street; Suite 1050
Dayton, OH 45402
www.therucksgroup.com
t 937-242-7024
f 937-242-7026

THE RUCKS GROUP LLC

# Table of Contents

# Background

Northeast Wisconsin Technical College (NWTC) is addressing workforce shortages in the energy and utilities sector through the development of the Utilities and Energy Coordination Network (UECN). This project is designed to expand training opportunities, create new programs, and develop curricula for high-demand energy-related roles across the nation by creating a platform for industry, higher education institutions, and other stakeholders to share resources and generate partnerships in gas, electrical power, and utilities engineering to address workforce shortages.

A key objective of this project is to understand the extent to which the curricula offered by colleges in the Network align with industry needs by gathering input from employers across a variety of utilities and energy-related sectors. The findings presented in this report represent the results of a survey of employers in the telecommunications industry. This survey was sent to 108 individuals in the telecommunications field; seventeen responses were received (16% response rate). This results report includes a summary of the quantitative and qualitative findings from the survey. A copy of the survey can be found in Appendix A.

# Findings

When asked to indicate the importance of hiring candidates' ability to use identified software, respondents rated several Microsoft Office products as important, particularly Excel and Outlook (Figure 1).
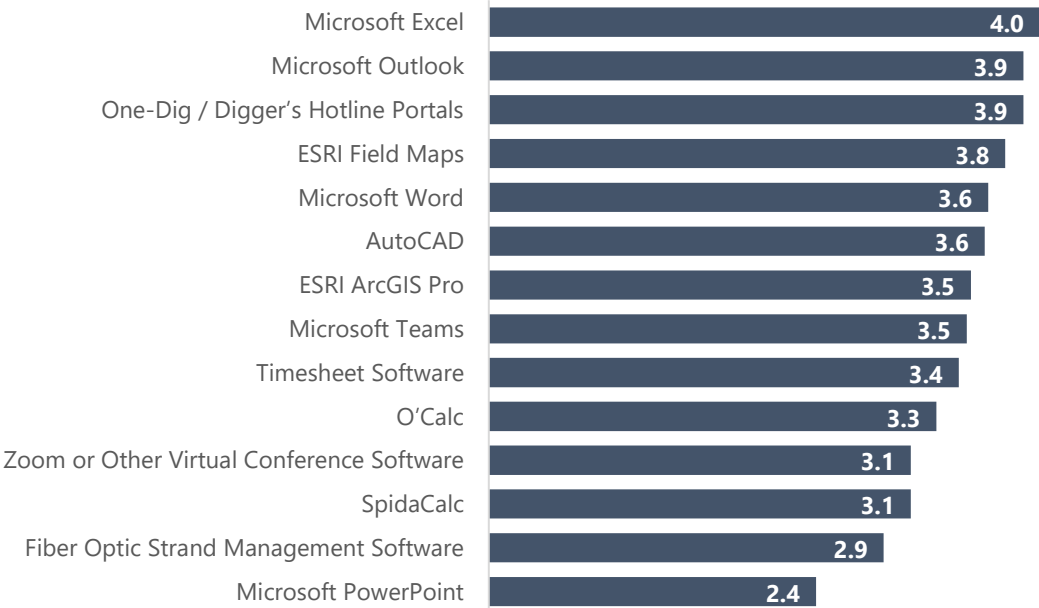


| Software | Rating |
|---|---|
| Microsoft Excel | 4.0 |
| Microsoft Outlook | 3.9 |
| One-Dig / Digger's Hotline Portals | 3.9 |
| ESRI Field Maps | 3.8 |
| Microsoft Word | 3.6 |
| AutoCAD | 3.6 |
| ESRI ArcGIS Pro | 3.5 |
| Microsoft Teams | 3.5 |
| Timesheet Software | 3.4 |
| O'Calc | 3.3 |
| Zoom or Other Virtual Conference Software | 3.1 |
| SpidaCalc | 3.1 |
| Fiber Optic Strand Management Software | 2.9 |
| Microsoft PowerPoint | 2.4 |

**Figure 1.** Average ratings to the question, *"Please indicate how important each of the following software skills are to your company when hiring"* (n=17). Scale: 1=not at all important to 5=extremely important.

Respondents were then asked to identify proficiencies in other tools or software not listed in the previous question that they look for in potential hiring candidates. Their responses included:

- *Adobe Pro*
- *Ability to learn ERPs; Understand how data is connected and flows through a process*
- *Basic photo, upload docs, blue print*
- *Software knowledge isn't life or death, there are a million programs out there. Its more about how well the potential candidate can pick up on things. However, they need to have base skill of AutoCAD or ESRI to be employable. Also utilizing Microsoft programs is essential just to make things easy.*
- *We have many digital solutions: Procore, Samsara, Fleetio, and several customer systems so skills on digital systems of any type are important to us.*

Respondents rated MS Windows computers as the most important hardware for potential hires to be able to use (Figure 2).
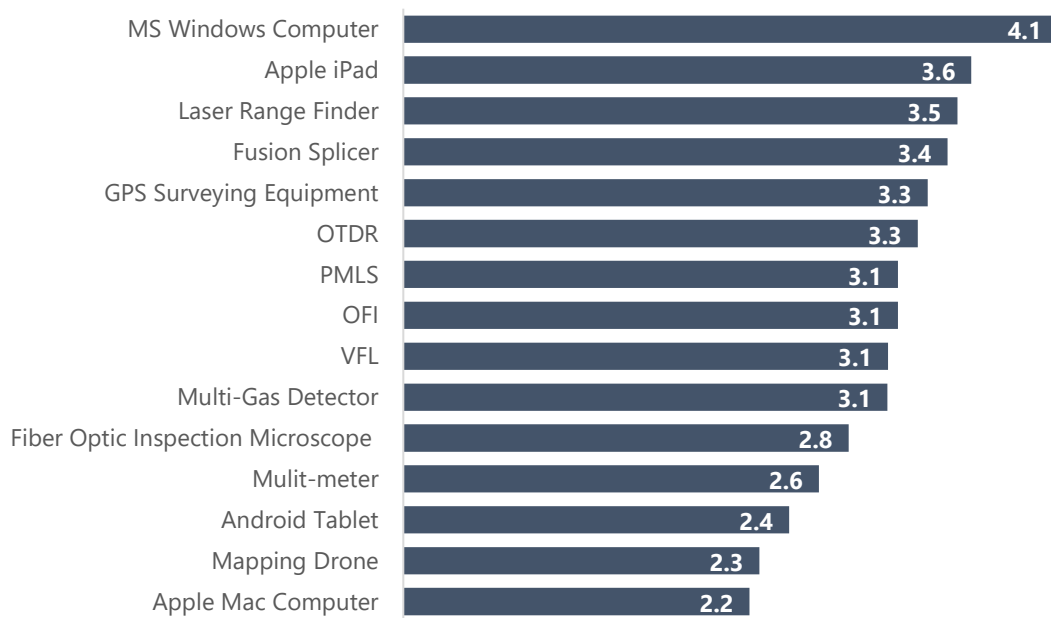
| Hardware | Rating |
|---|---|
| MS Windows Computer | 4.1 |
| Apple iPad | 3.6 |
| Laser Range Finder | 3.5 |
| Fusion Splicer | 3.4 |
| GPS Surveying Equipment | 3.3 |
| OTDR | 3.3 |
| PMLS | 3.1 |
| OFI | 3.1 |
| VFL | 3.1 |
| Multi-Gas Detector | 3.1 |
| Fiber Optic Inspection Microscope | 2.8 |
| Mulit-meter | 2.6 |
| Android Tablet | 2.4 |
| Mapping Drone | 2.3 |
| Apple Mac Computer | 2.2 |

**Figure 2.** Average ratings to the question, *"Please indicate how important the ability to use each of the following hardware is to your company when hiring"* (n=17). Scale: 1=not at all important to 5=extremely important.

When respondents were asked to rate the importance of the provided tools when considering potential candidates, the use of utility pole measuring sticks and measuring wheels were rated the highest (Figure 3).
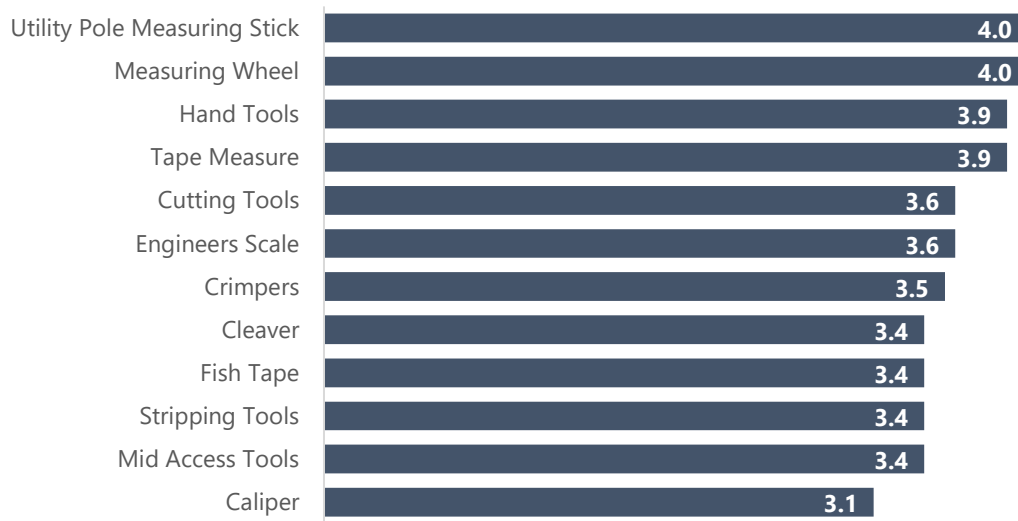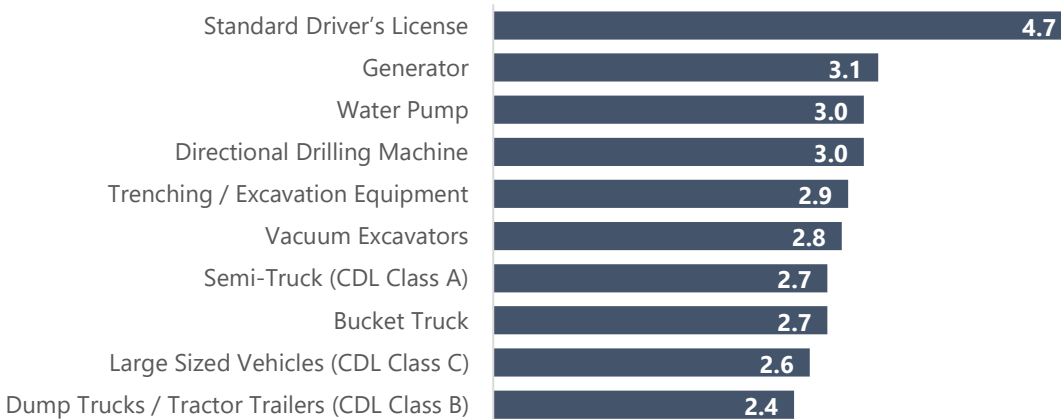


**Figure 3.** Average ratings to the question, *"Please indicate how important the ability to use each of the following tools is to your company when hiring"* (n=17). Scale: 1=not at all important to 5=extremely important

Respondents were then asked to rate the importance of power equipment experience when hiring; having a standard driver's license was rated as most important (Figure 4).



**Figure 4.** Average ratings to the question, *"Please indicate how important each of the following reporting skills is to your company when hiring"* (n=17). Scale: 1=not at all important to 5= extremely important.

When asked to rate the importance of each identified skill to their company when hiring, respondents rated being on time to work and project sites as the highest priority (Figure 5).



| Skill | Rating |
|---|---|
| Being on time to work and project sites | 4.9 |
| Ability to communicate effectively with colleagues | 4.9 |
| Ability to work as a team | 4.7 |
| Ability to communicate effectively with the customer | 4.6 |
| Adaptability | 4.6 |
| Understand safety procedures and workplace hazards | 4.6 |
| Ability to summarize and present information to decision makers | 4.4 |
| Ability to work individually | 4.3 |
| Understand different types of fiber optic and communication cables | 4.3 |
| Project management skills | 4.2 |

**Figure 5.** Average ratings to the question, *"Please indicate how important the following new employee skills are to your company when hiring"* (n=17). Scale: 1=not at all important to 5= extremely important.

Respondents were then asked to rank the provided list of other professional skills in order of importance for hiring in their organization, with problem solving ranked the highest (Table 5).

| Professional Skill | Average Rank |
|---|---|
| Problem solving | 3.1 |
| Verbal and written communication skills | 3.3 |
| Team-building skills, teamwork | 3.4 |
| Customer service | 3.6 |
| Computer skills | 4.8 |
| Conflict resolution | 5.1 |
| Handling feedback | 5.9 |
| Diversity, equity, and inclusion; interaction with diverse populations | 6.8 |

**Table 1.** Average rankings to the question, *"Please rank the following list of professional skills, in the order of importance for hiring in your organization"* (n=17). Scale: 1=most important to 8=least important

Most companies provide their own training opportunities (Figure 5).

| Training Opportunity | Count |
|---|---|
| Company-sponsored training | 15 |
| Software | 14 |
| Job shadowing | 13 |
| Webinars | 12 |
| OSHA / Safety | 12 |
| Conferences and Exhibitions | 11 |
| Paid Internships | 10 |
| Continuing Education reimbursements | 9 |
| Technical College Partnerships / Work Release for Skills | 9 |
| Unpaid internships | 5 |
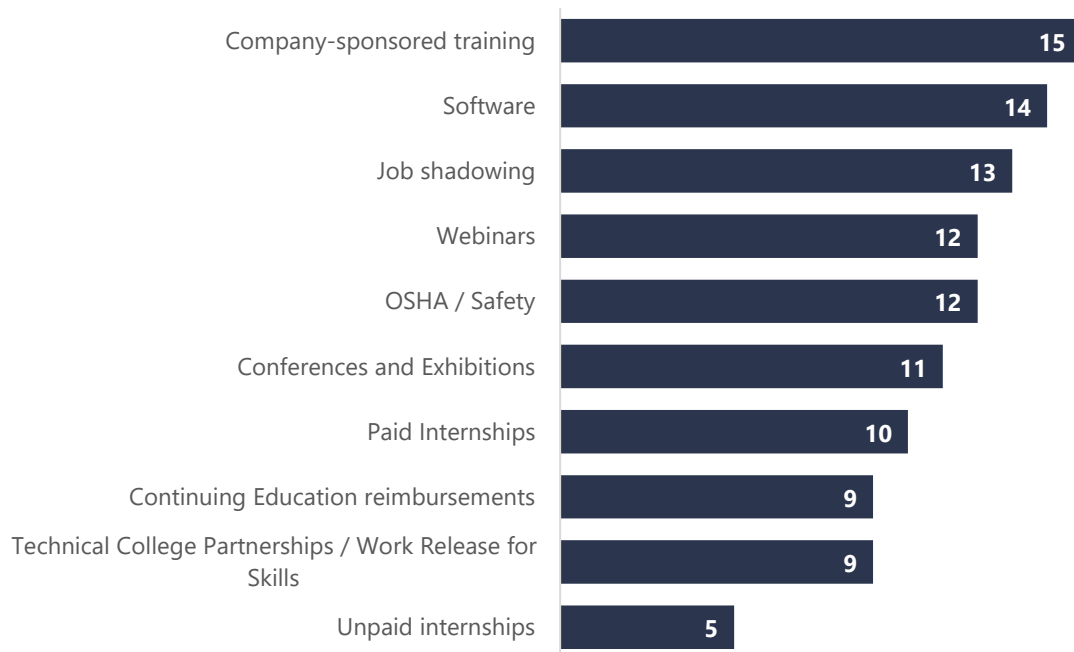
**Figure 5.** Frequency of responses to the question, *"What training opportunities does your organization provide?"* (n=17).

When asked to describe other skills that colleges should help students develop to prepare for roles in energy management, respondents included professional and technical skills as well as industry knowledge:

| Theme | Comments |
|---|---|
| **Professional skills** | <ul><li>Curiosity</li><li>Engagement in job tasks.</li><li>Productivity without sacrificing quality.</li><li>Professionalism, timeliness, commitment</li></ul> |
| **Technical skills** | <ul><li>Hazard recognition, accident investigation, and human performance improvement training.</li><li>Knowledge of Utility Types and Utility Mapping</li><li>Training for various FTTX network Architecture designs</li></ul> |
| **Industry knowledge** | <ul><li>[How] industry and technology are evolving</li><li>Understanding how various municipal codes play into the design parameters of underground networks within public rights of way</li></ul> |

**Table 2.** Additional skills for roles identified by employers in energy management.

Employers reported that FOA Fiber Optics certifications are the most important for potential hires to have (Figure 5).
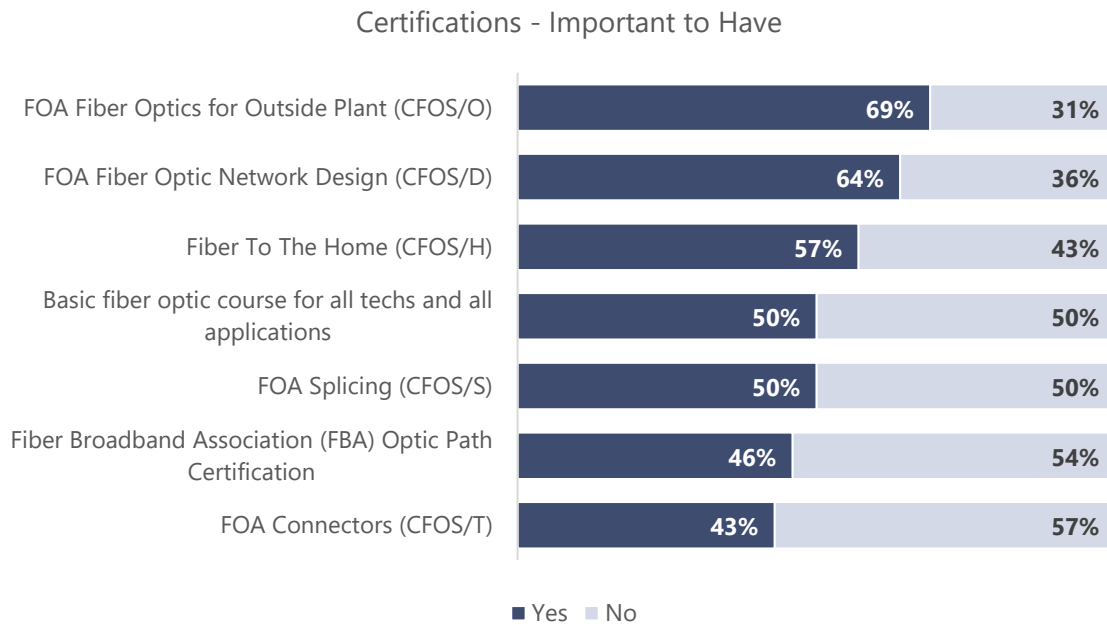
## Certifications - Important to Have

| Certification | Yes | No |
|---|---|---|
| FOA Fiber Optics for Outside Plant (CFOS/O) | 69% | 31% |
| FOA Fiber Optic Network Design (CFOS/D) | 64% | 36% |
| Fiber To The Home (CFOS/H) | 57% | 43% |
| Basic fiber optic course for all techs and all applications | 50% | 50% |
| FOA Splicing (CFOS/S) | 50% | 50% |
| Fiber Broadband Association (FBA) Optic Path Certification | 46% | 54% |
| FOA Connectors (CFOS/T) | 43% | 57% |

■ Yes  ■ No

**Figure 5.** Frequency of responses to the question, *"Please indicate if the following industry certifications important to your organization and if will you pay a new employee more if they have the certification?"* (n=17).

Over 50% of employers were willing to pay potential hires more for having these certifications (Figure 6).

## Certifications - Will Pay More For

| Certification | Yes | No |
|---|---|---|
| FOA Fiber Optics for Outside Plant (CFOS/O) | 58% | 42% |
| FOA Fiber Optic Network Design (CFOS/D) | 62% | 38% |
| Fiber To The Home (CFOS/H) | 58% | 42% |
| Basic fiber optic course for all techs and all applications | 27% | 73% |
| FOA Splicing (CFOS/S) | 50% | 50% |
| Fiber Broadband Association (FBA) Optic Path Certification | 58% | 42% |
| FOA Connectors (CFOS/T) | 42% | 58% |

■ Yes  ■ No
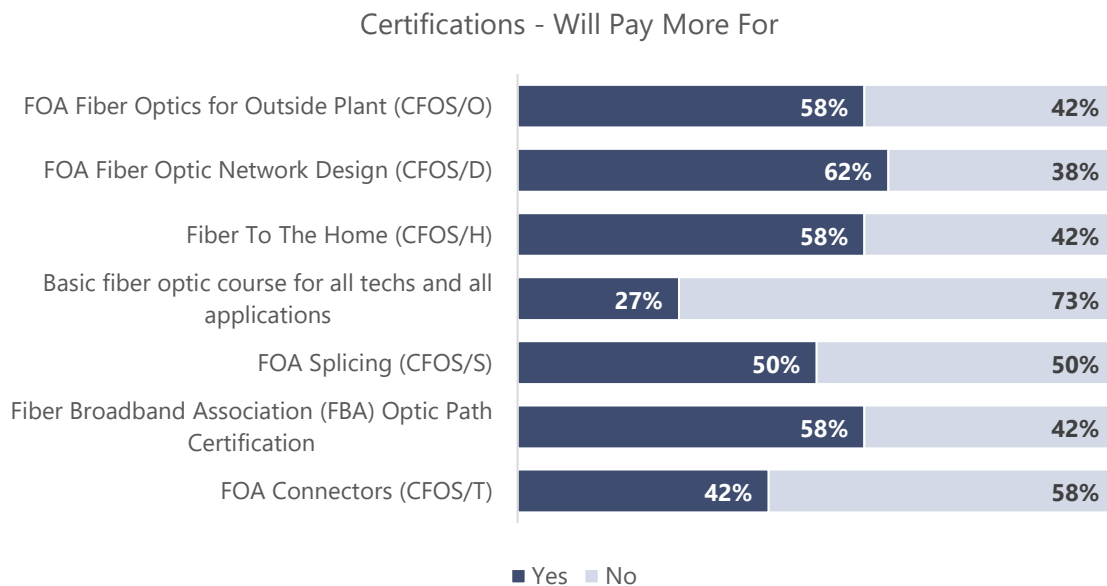
**Figure 6.** Frequency of responses to the question, *"Please indicate if the following industry certifications important to your organization and if will you pay a new employee more if they have the certification:"* (n=17).

Employers also reported that they most frequently hire individuals with the aforementioned competencies as project managers, followed by technicians, surveyors, laborers, and equipment operators (Figure 8).
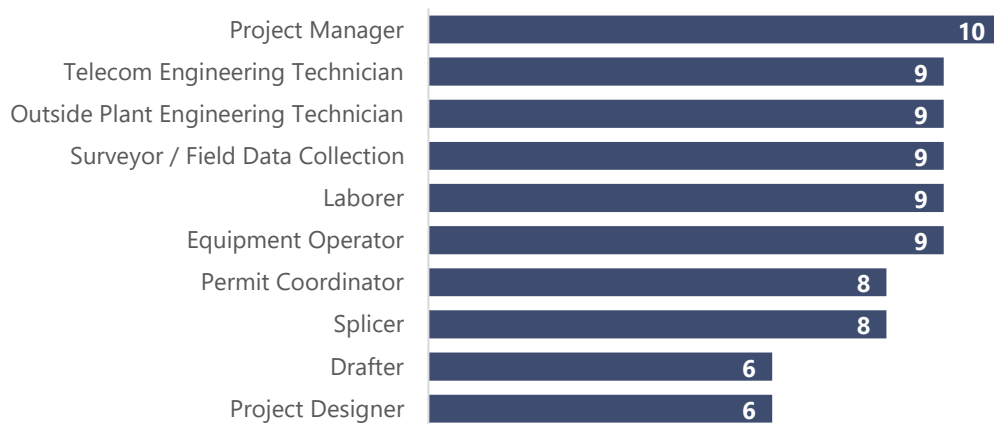


**Figure 8.** The top ten most frequent responses to the question, *"For what roles does your company hire job candidates that use the above competencies?"* (n=17).

Lastly, respondents were asked to report whether their company was connected with any educational institutions from which they regularly hire employees or where current employees can pursue additional training. Half of respondents said that their organization was connected to an educational institution (Figure 9).



**Figure 9.** Response frequency to the question, *"Is your company connected to any educational institutions from which you regularly hire employees and/or where current employees can pursue additional education or training?"* (n=16).

For those whose organizations were connected with at least one educational institution, two respondents reported being connected with NWTC:

- Northeast Wisconsin Technical College (2 respondents)
- Alpena Climbing School
- Lansing Technical College
- Northwest Lineman Training Center

# Final Thoughts

This results report is intended to provide a clear and concise summary of the survey responses from industry partners who responded to the telecommunications industry employer skills survey. The interpretation of this information in relation to this project's evaluation questions along with corresponding recommendations will be included in the annual evaluation report.

# Appendix A: Telecommunications Employer Skills Survey

Q1 As part of the Utilities and Energy Coordination Network (UECN) grant at Northeast Wisconsin Technical College, we are requesting your input regarding the skills needed by job candidates in the telecommunications industry. This survey will take approximately 10 minutes and will provide valuable information for the Network to understand the extent to which the existing curricula are meeting industry's needs. Your response will remain anonymous and confidential; responses will be aggregated for reporting. Thank you.

Q2 Please indicate how important each of the following software skills are to your company when hiring:

| | Extremely important | Very important | Moderately important | Slightly important | Not at all important |
|---|---|---|---|---|---|
| Microsoft Excel | ○ | ○ | ○ | ○ | ○ |
| Microsoft Word | ○ | ○ | ○ | ○ | ○ |
| Microsoft Outlook | ○ | ○ | ○ | ○ | ○ |
| Microsoft PowerPoint | ○ | ○ | ○ | ○ | ○ |
| Microsoft Teams | ○ | ○ | ○ | ○ | ○ |
| Zoom or Other Virtual Conference Software | ○ | ○ | ○ | ○ | ○ |
| Timesheet Software | ○ | ○ | ○ | ○ | ○ |
| One-Dig / Digger's Hotline Portals | ○ | ○ | ○ | ○ | ○ |
| AutoCAD | ○ | ○ | ○ | ○ | ○ |
| ESRI ArcGIS Pro | ○ | ○ | ○ | ○ | ○ |
| ESRI Field Maps | ○ | ○ | ○ | ○ | ○ |
| Fiber Optic Strand Management Software (Vetro) | ○ | ○ | ○ | ○ | ○ |
| O'Calc | ○ | ○ | ○ | ○ | ○ |
| SpidaCalc | ○ | ○ | ○ | ○ | ○ |

Q3 What, if any, software knowledge not listed previously is your organization looking for?

_____

Q4 Please indicate how important the ability to use each of the following hardware is to your company when hiring:

| | Extremely important | Very important | Moderately important | Slightly important | Not at all important |
|---|---|---|---|---|---|
| Optical Time Domain Reflectometer (OTDR) | ○ | ○ | ○ | ○ | ○ |
| Power Meter & Light Source (PMLS) | ○ | ○ | ○ | ○ | ○ |
| Visual Fault Locator (VFL) | ○ | ○ | ○ | ○ | ○ |
| Optical Fiber Identifier (OFI) | ○ | ○ | ○ | ○ | ○ |
| Fiber Optic Inspection Microscope (Digital) | ○ | ○ | ○ | ○ | ○ |
| Fusion Splicer | ○ | ○ | ○ | ○ | ○ |
| Multi-Gas Detector | ○ | ○ | ○ | ○ | ○ |
| Mulit-meter | ○ | ○ | ○ | ○ | ○ |
| GNSS (GPS) Surveying Equipment | ○ | ○ | ○ | ○ | ○ |
| Laser Range Finder | ○ | ○ | ○ | ○ | ○ |
| Mapping Drone | ○ | ○ | ○ | ○ | ○ |
| MS Windows Computer | ○ | ○ | ○ | ○ | ○ |
| Apple Mac Computer | ○ | ○ | ○ | ○ | ○ |
| Android Tablet | ○ | ○ | ○ | ○ | ○ |
| Apple iPad | ○ | ○ | ○ | ○ | ○ |

Q5 Please indicate how important the ability to use each of the following tools is to your company when hiring:

| | Extremely important | Very important | Moderately important | Slightly important | Not at all important |
|---|---|---|---|---|---|
| Stripping Tools | ○ | ○ | ○ | ○ | ○ |
| Cutting Tools | ○ | ○ | ○ | ○ | ○ |
| Hand Tools | ○ | ○ | ○ | ○ | ○ |
| Crimpers | ○ | ○ | ○ | ○ | ○ |
| Mid Access Tools (Mid-sheath) | ○ | ○ | ○ | ○ | ○ |
| Cleaver | ○ | ○ | ○ | ○ | ○ |
| Fish Tape | ○ | ○ | ○ | ○ | ○ |
| Utility Pole Measuring Stick | ○ | ○ | ○ | ○ | ○ |
| Caliper | ○ | ○ | ○ | ○ | ○ |
| Measuring Wheel | ○ | ○ | ○ | ○ | ○ |
| Engineers Scale (Ruler) | ○ | ○ | ○ | ○ | ○ |
| Tape Measure | ○ | ○ | ○ | ○ | ○ |

Q6 Please indicate how important the ability to use the following power equipment is to your company when hiring:

| | Extremely important | Very important | Moderately important | Slightly important | Not at all important |
|---|---|---|---|---|---|
| Water Pump | ○ | ○ | ○ | ○ | ○ |
| Generator | ○ | ○ | ○ | ○ | ○ |
| Bucket Truck | ○ | ○ | ○ | ○ | ○ |
| Directional Drilling Machine (Bore Rig) | ○ | ○ | ○ | ○ | ○ |
| Vacuum Excavators | ○ | ○ | ○ | ○ | ○ |
| Trenching / Excavation Equipment | ○ | ○ | ○ | ○ | ○ |
| Semi-Truck (CDL Class A) | ○ | ○ | ○ | ○ | ○ |
| Dump Trucks / Tractor Trailers (CDL Class B) | ○ | ○ | ○ | ○ | ○ |
| Large Sized Vehicles (CDL Class C) | ○ | ○ | ○ | ○ | ○ |
| Standard Driver's License | ○ | ○ | ○ | ○ | ○ |

Q7 Please indicate how important the following new employee skills are to your company when hiring:

| | Extremely important | Very important | Moderately important | Slightly important | Not at all important |
|---|---|---|---|---|---|
| Ability to communicate effectively with the customer | ○ | ○ | ○ | ○ | ○ |
| Ability to communicate effectively with colleagues | ○ | ○ | ○ | ○ | ○ |
| Ability to create coherent and professional emailsg | ○ | ○ | ○ | ○ | ○ |
| Ability to create coherent and professional documents | ○ | ○ | ○ | ○ | ○ |
| Ability to create material lists | ○ | ○ | ○ | ○ | ○ |
| Ability to create bid documents | ○ | ○ | ○ | ○ | ○ |
| Ability to perform conversions between different units of measurements | ○ | ○ | ○ | ○ | ○ |
| Ability to work individually | ○ | ○ | ○ | ○ | ○ |
| Ability to work as a team | ○ | ○ | ○ | ○ | ○ |
| Ability to work remotely effectively | ○ | ○ | ○ | ○ | ○ |
| Ability to work in an office setting effectively | ○ | ○ | ○ | ○ | ○ |
| Being on time to work and project sites | ○ | ○ | ○ | ○ | ○ |
| Project management skills | ○ | ○ | ○ | ○ | ○ |
| Adaptability | ○ | ○ | ○ | ○ | ○ |
| Ability to summarize and present information to decision makers | ○ | ○ | ○ | ○ | ○ |
| Being physically fit for outdoor field work | ○ | ○ | ○ | ○ | ○ |
| Being able to work at a computer or desk for long periods | ○ | ○ | ○ | ○ | ○ |

Q8 Please indicate how important the following new employee skills are to your company when hiring:

| | Extremely important | Very important | Moderately important | Slightly important | Not at all important |
|---|---|---|---|---|---|
| Understand safety procedures and workplace hazards | ○ | ○ | ○ | ○ | ○ |
| Ability to establish effective traffic control devices when working in the field | ○ | ○ | ○ | ○ | ○ |
| Effective use of Apple iOS software | ○ | ○ | ○ | ○ | ○ |
| Understand and operate fiber optic testing tools | ○ | ○ | ○ | ○ | ○ |
| Proficiently use digital drafting software | ○ | ○ | ○ | ○ | ○ |
| Understand utility pole wind, sag, and loading software | ○ | ○ | ○ | ○ | ○ |
| Understanding the bidding and procurement process | ○ | ○ | ○ | ○ | ○ |
| Create expense reports | ○ | ○ | ○ | ○ | ○ |
| Fill out time sheets | ○ | ○ | ○ | ○ | ○ |
| Understand different types of fiber optic and communication cables | ○ | ○ | ○ | ○ | ○ |
| Understand the characteristics of fiber optic cables | ○ | ○ | ○ | ○ | ○ |
| Understand how to install splice cases and termination panels | ○ | ○ | ○ | ○ | ○ |
| Understand wireless technologies | ○ | ○ | ○ | ○ | ○ |

Q9 Please rank the following list of professional skills, in the order of importance for hiring in your organization.

_____ Computer skills: Microsoft Office word processing, spreadsheets, presentations
_____ Conflict resolution
_____ Customer service
_____ Diversity, equity, and inclusion; interaction with diverse populations
_____ Handling feedback
_____ Problem solving
_____ Team-building skills, teamwork
_____ Verbal and written communication skills

Q10 What training opportunities does your organization provide?

| | Yes | No |
|---|---|---|
| Continuing Education reimbursements | ○ | ○ |
| Technical College Partnerships / Work Release for Skills | ○ | ○ |
| Paid Internships | ○ | ○ |
| Unpaid internships | ○ | ○ |
| Job shadowing | ○ | ○ |
| Company-sponsored training | ○ | ○ |
| Software | ○ | ○ |
| Webinars | ○ | ○ |
| Conferences and Exhibitions | ○ | ○ |
| OSHA / Safety | ○ | ○ |
| Other: | ○ | ○ |

Q11 What other skills should colleges help students to develop to best prepare for roles in the telecommunications industry? _____

Q12 Please indicate if the following industry certifications important to your organization and if will you pay a new employee more if they have the certification:

| | Important to have | Will pay more with certification |
|---|---|---|
| Fiber Broadband Association (FBA) Optic Path Certification: (8 weeks of extensive installation, testing, and troubleshooting training) | ▼ Yes ... No | ▼ Yes ... No |
| Fiber Optic Administration (FOA) Certified Fiber Optic Technician (CFOT): Basic fiber optic course for all techs and all applications (2 week training) | ▼ Yes ... No | ▼ Yes ... No |
| FOA Fiber Optic Network Design (CFOS/D): Basic fiber optic course focused on designing fiber optic networks and managing their installation. | ▼ Yes ... No | ▼ Yes ... No |
| FOA Fiber Optics for Outside Plant (CFOS/O): Course focused on OSP (outside plant) construction and installation | ▼ Yes ... No | ▼ Yes ... No |
| FOA Splicing (CFOS/S): How to splice fibers using fusion and mechanical splices | ▼ Yes ... No | ▼ Yes ... No |
| FOA Connectors (CFOS/T): Comprehensive training on fiber optic testing techniques | ▼ Yes ... No | ▼ Yes ... No |
| Fiber To The Home (CFOS/H): Comprehensive training on fiber to the home applications including standards, network architecture, design, installation and test | ▼ Yes ... No | ▼ Yes ... No |

Q13 For what roles does your company hire job candidates that use the above competencies?

☐ Telecom Engineering Technician (Oversees and assists in all design tasks)

☐ Outside Plant Engineering Technician

☐ Drafter

☐ Surveyor / Field Data Collection

☐ Bidding and Procurement Specialist

☐ Project Designer

☐ Permit Coordinator

☐ Project Manager (Oversees and assists in all installation)

☐ Network Support

☐ Network Management

☐ Splicer

☐ Laborer

☐ Equipment Operator

☐ Tower Technician

☐ Other: _____

Q14 Is your company connected to any educational institutions from which you regularly hire employees and/or where current employees can pursue additional education or training?

○ Yes

○ No

Display This Question: If Is your company connected to any educational institutions from which you regularly hire employees… = Yes

Q15 With what educational institutions are you connected? _____