



CEA Workforce Development & Curriculum Needs Assessment

Angela Cottrell, EdD & Juan Cabrera-Garcia, PhD
Indoor Ag-Con 28 FEB 2023

USDA 2023-70003-38775

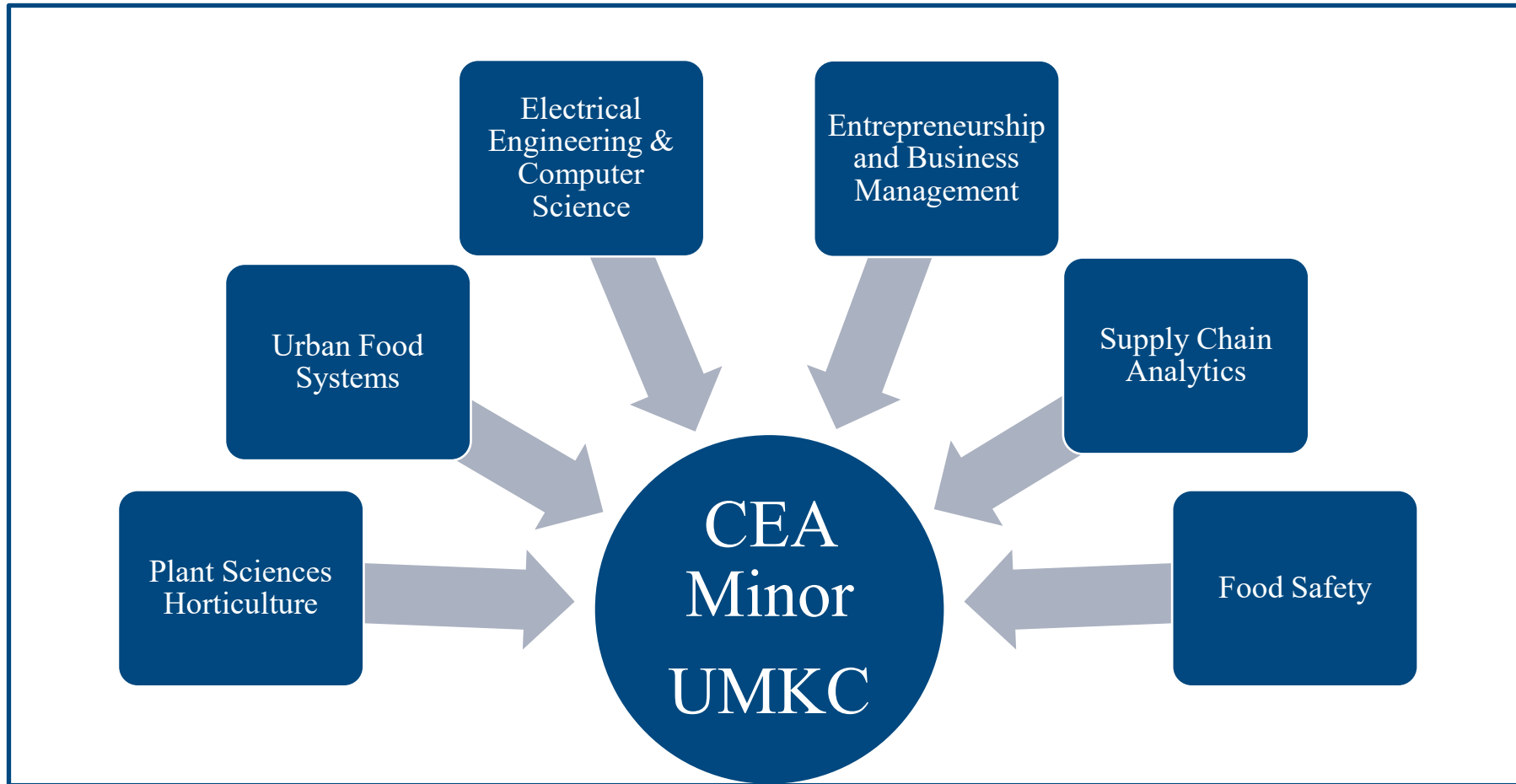
Project Summary

Our goal is to attract new students interested in CEA and expose current students from other disciplines to urban agriculture by creating a multidisciplinary educational program focused on CEA at the University of Missouri – Kansas City (UMKC)

We seek to conduct:

- (1) Student and industry surveys to assess needs and expectations for a future educational program
- (2) Present needs assessment findings to industry partners and educational leaders and host a strategic planning session on developing a CEA minor at UMKC
- (3) Develop a self-sustaining curriculum model to prepare a collaborative USDA Higher Education Challenge grant proposal for 2023

Project Summary





Industry Survey

Survey Description

Survey was distributed via Indoor AgCon listserv, with the goal of providing information to **develop curriculum and training tracks that fit the needs of the CEA industry**. We asked the industry about the **skills** required for different **positions** and the **degree** needed to acquire those skills.

Positions:

1. Farm worker
2. Farm manager
3. R&D Technician
4. R&D Lead/Director
5. Marketing specialist
6. Food safety coordinator
7. CEA Entrepreneur/Investor
8. CEA Farm owner

Skills (top five being highlighted for each position).

- Food safety
- Integrated pest management
- Programming and coding
- Basic chemistry
- Basic plant physiology
- Advanced plant physiology
- Statistics
- Experimental design and data analysis
- Leadership
- Logistics
- Financing
- Accounting
- Marketing
- Quality Assurance
- Quality Control
- Microbiology
- Human Resource Management
- Economics
- Conflict Management
- Empathy
- Critical listening
- Advertising
- Other (please specify)

Degrees (top three being highlighted for each position).

- High school degree*
- Apprenticeship program
- Career certificate program
- Two-year associate degree
- Minor degree of an established Bachelor's degree
- Bachelor's degree
- Graduate education
- Other (please specify)

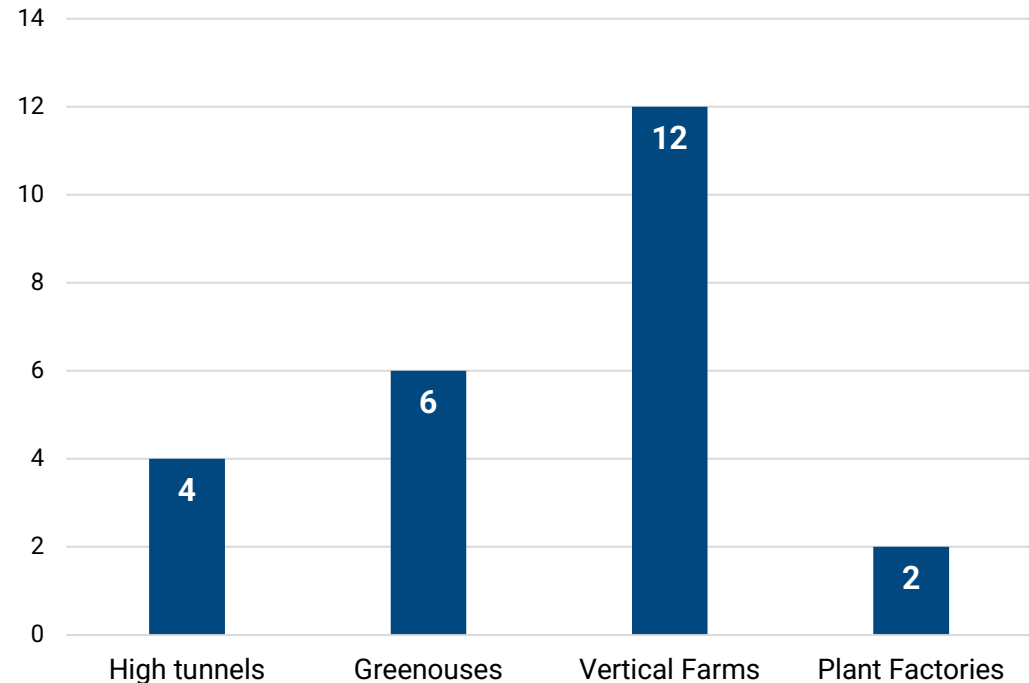
*High school degree was only an option on 'Farm Worker'

Businesses of Respondents

37% of respondents have CEA companies/farms that are growing and selling crops. Some of which include:

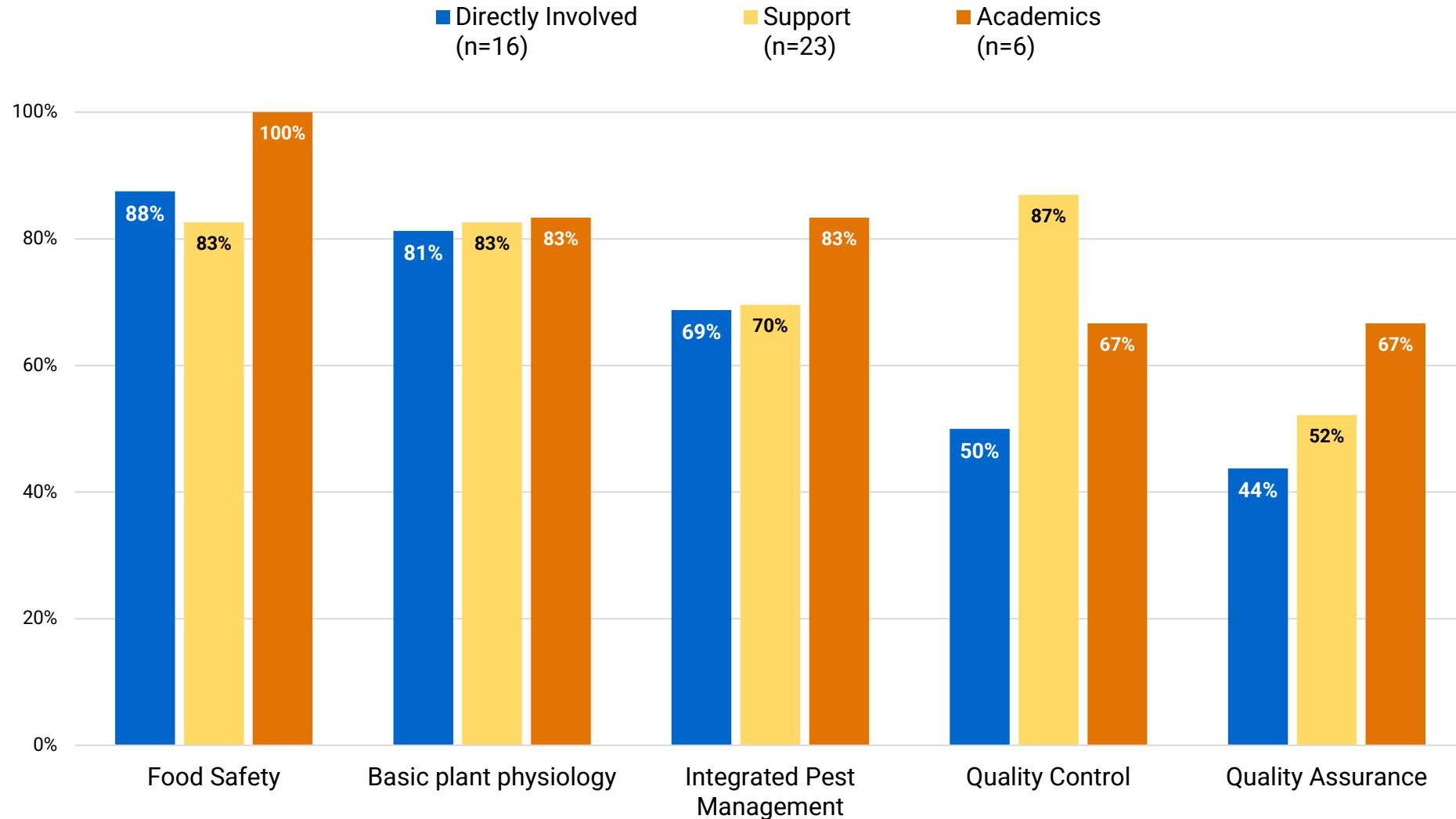
babygreens herbs fish
microgreens edibleflowers
tomatoes leafygreens
turmeric cucumbers
peppers
strawberries collardgreens
mustardgreens cannabis

82% of respondents have CEA farms/businesses that are in the United States. The following are the types of production units used to grow crops:



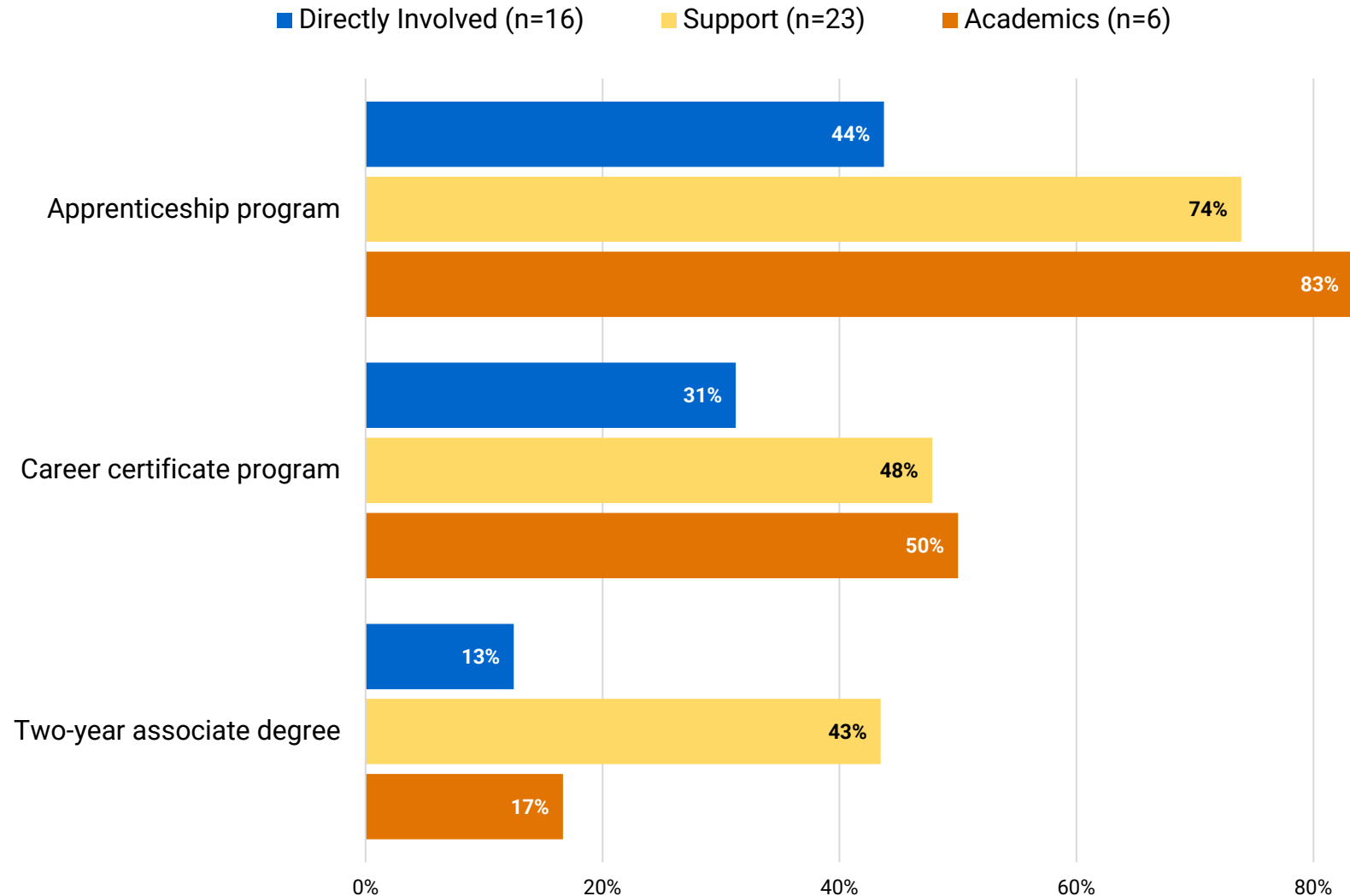
Farm Worker: Top 5 Skills Needed

According to Industry Professionals



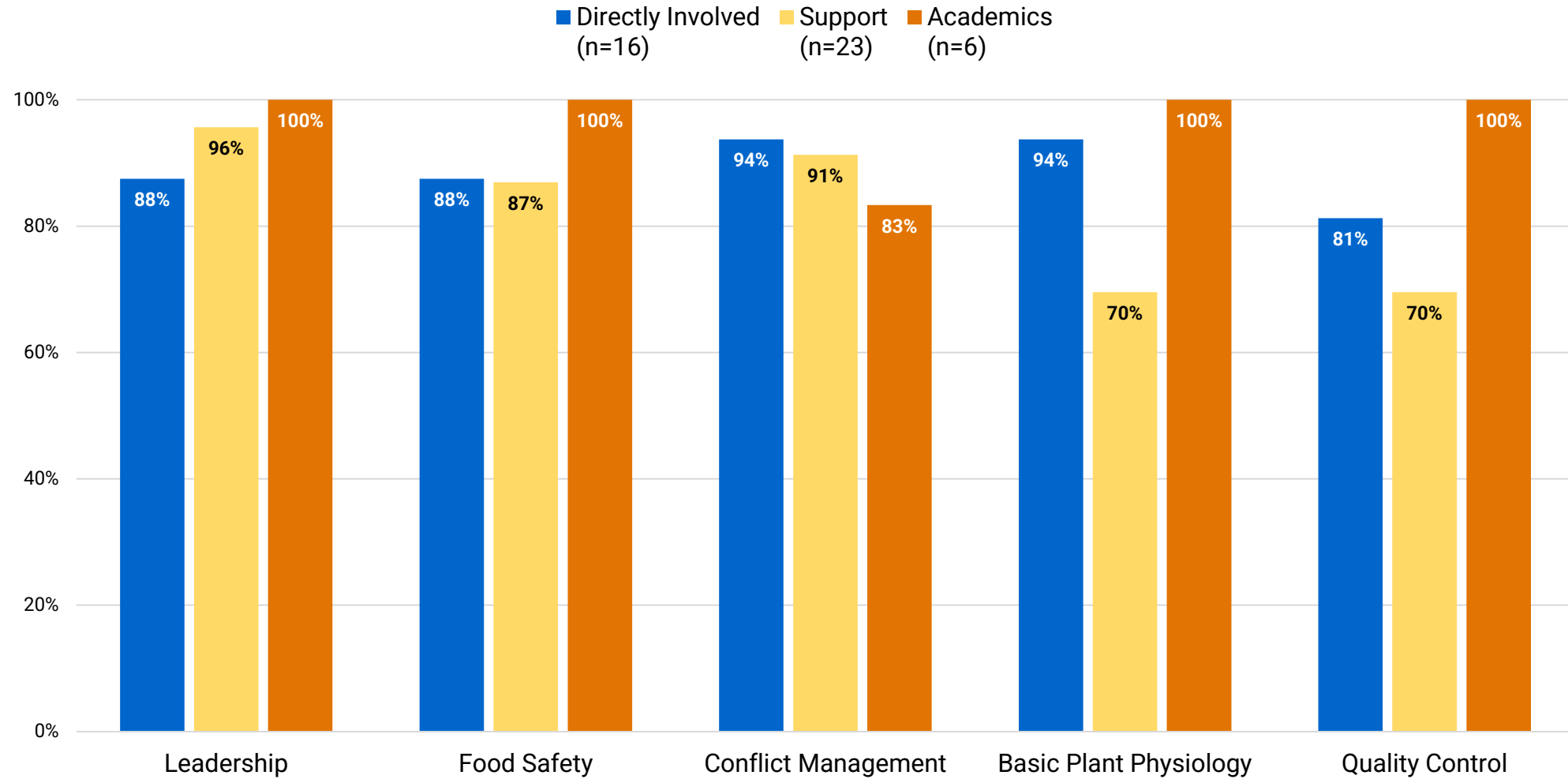
Farm Worker: Degree Needed

According to Industry Professionals



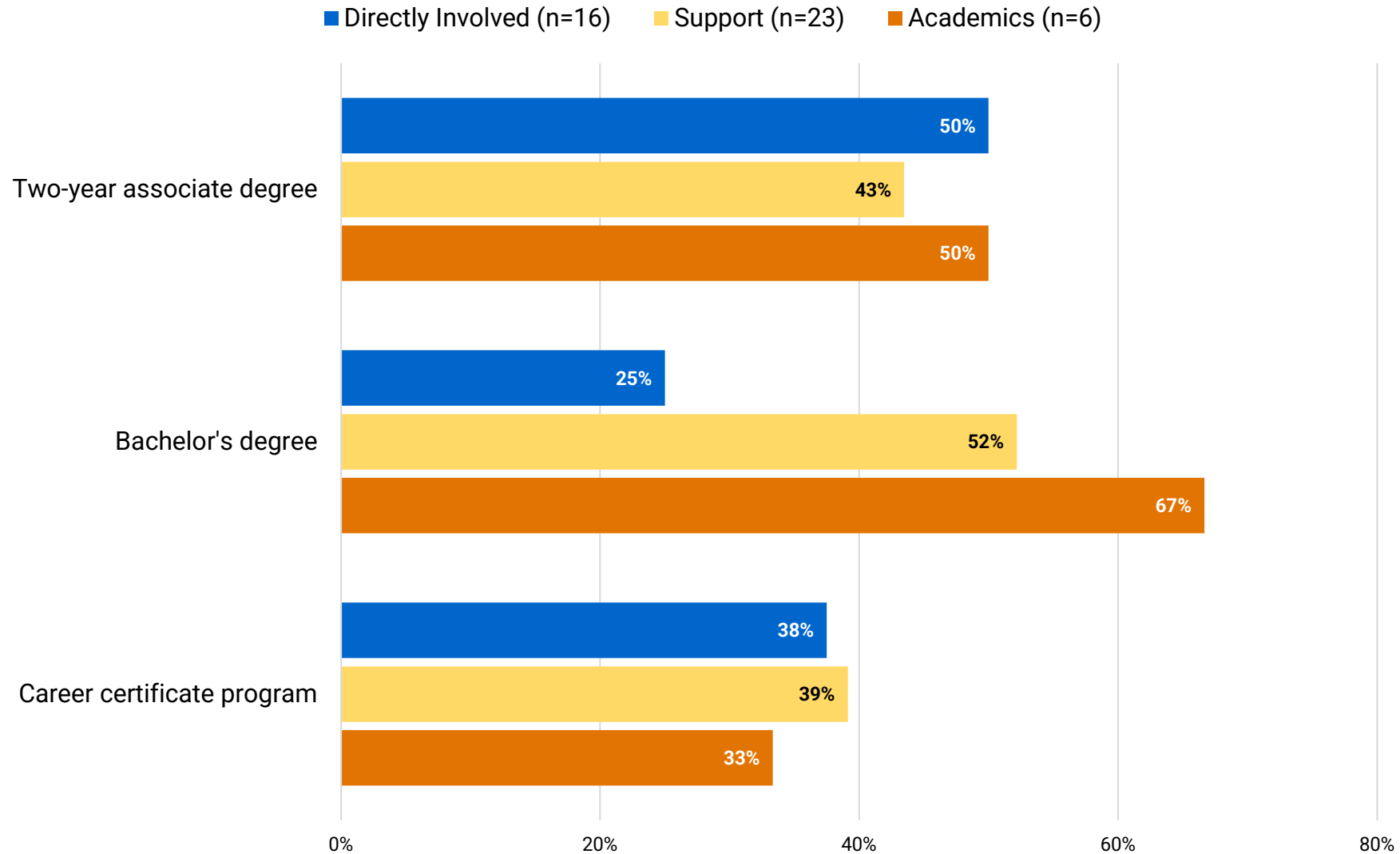
Farm Manager: Skills Needed

According to Industry Professionals



Farm Manager: Degree Needed

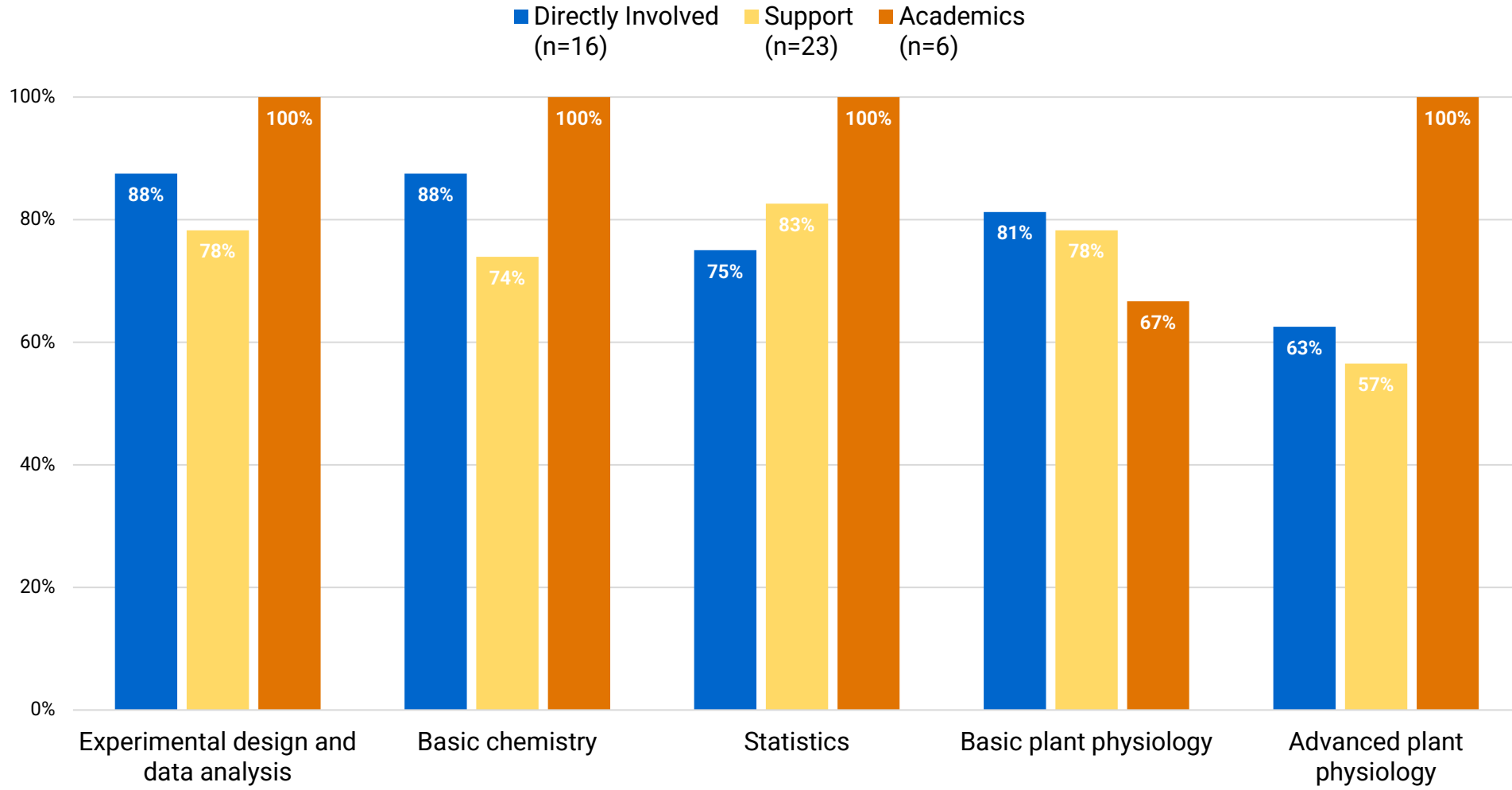
According to Industry Professionals



*Top 3 responses displayed

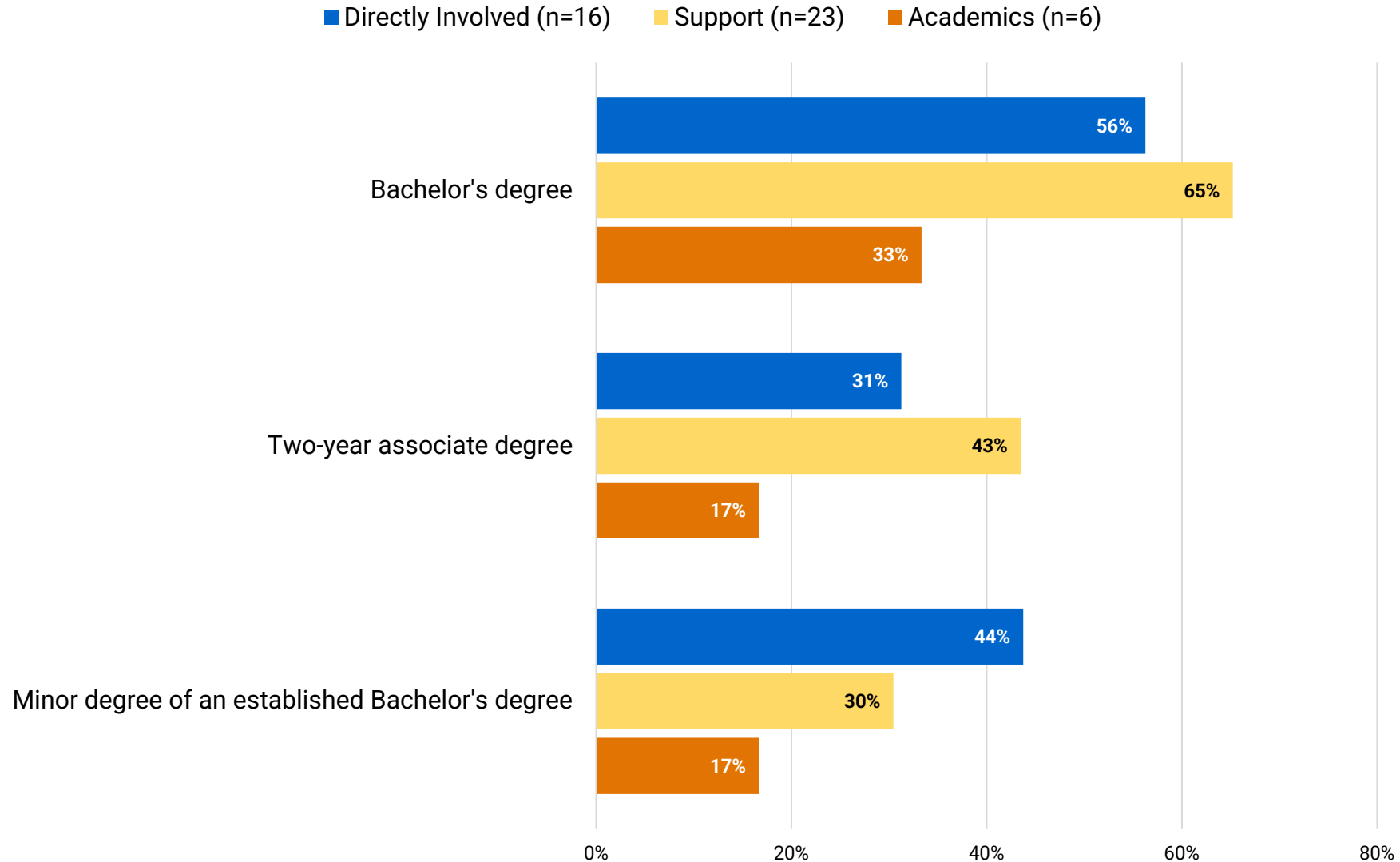
R&D Technician: Skills Needed

According to Industry Professionals



R&D Technician: Degree Needed

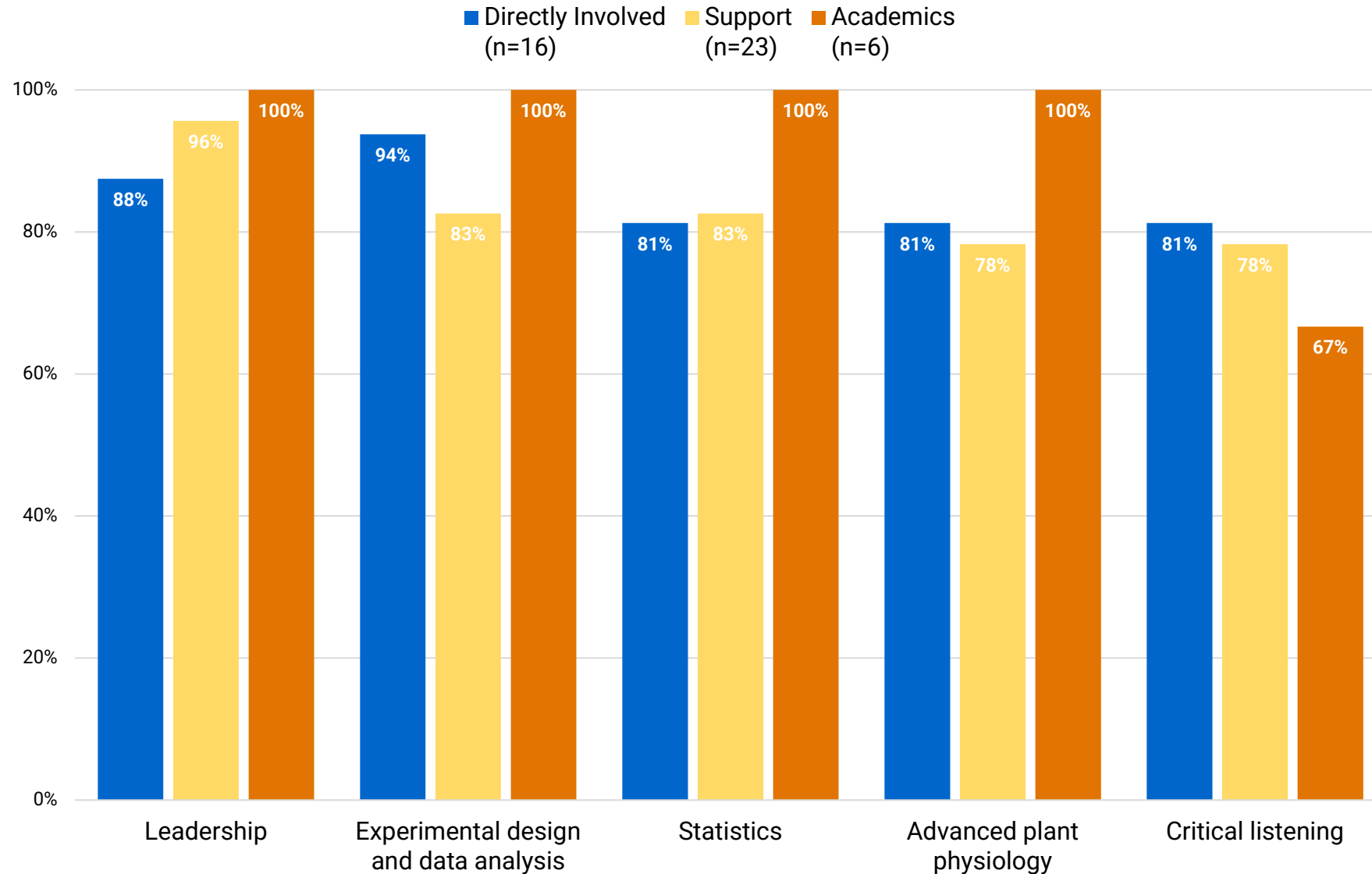
According to Industry Professionals



*Top 3 responses displayed

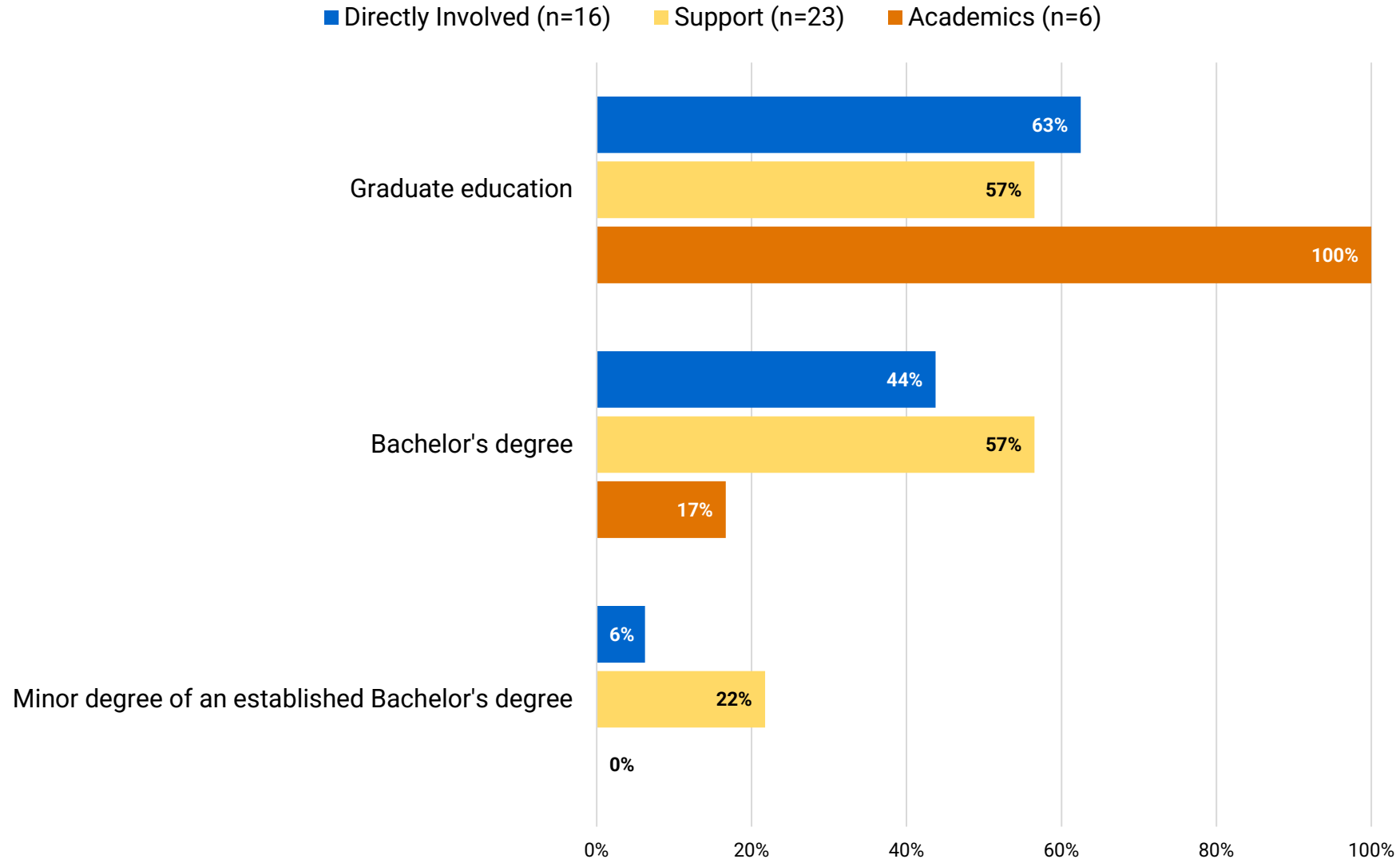
R&D Lead / Director: Skills Needed

According to Industry Professionals



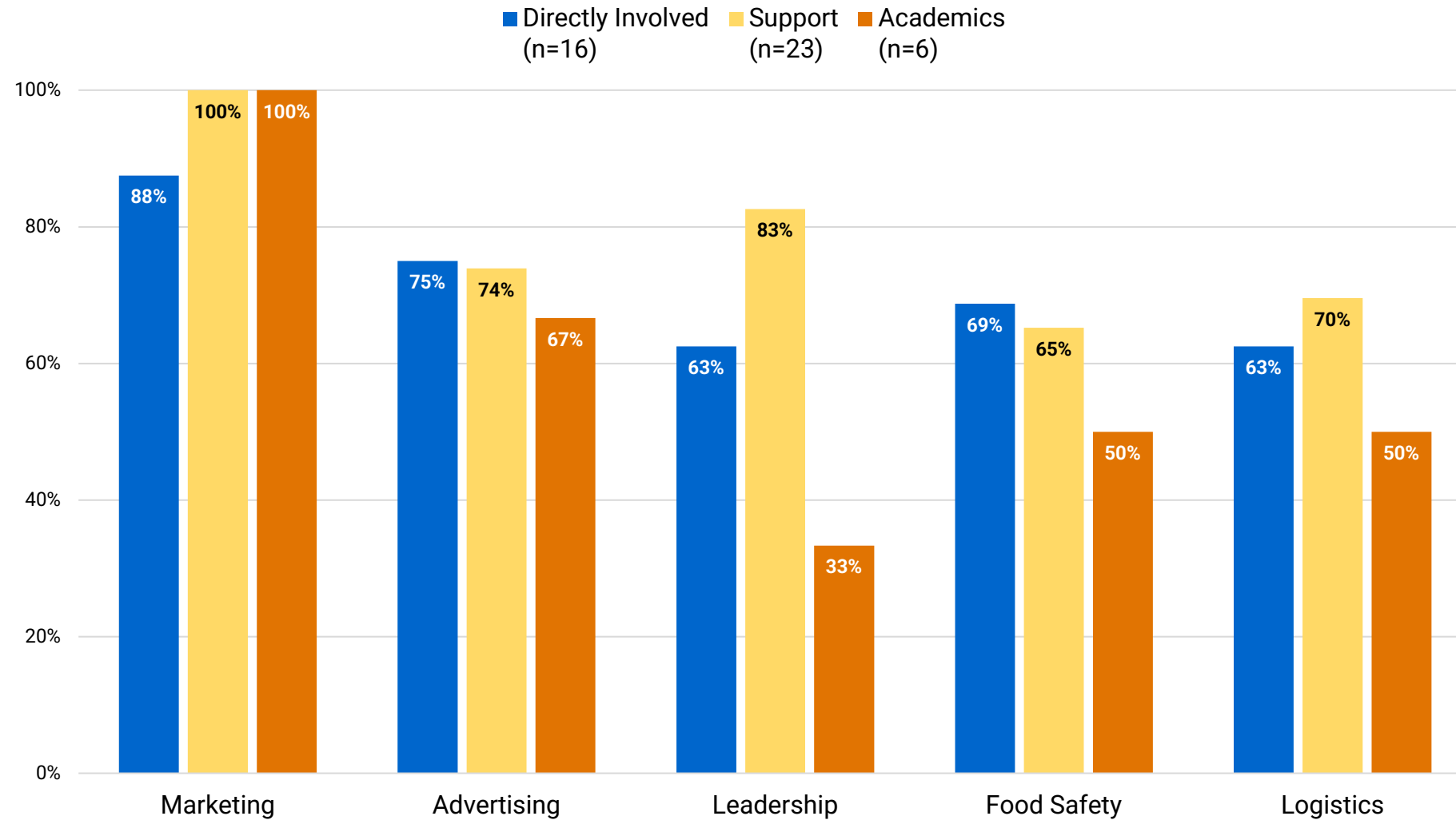
R&D Lead / Director: Degree Needed

According to Industry Professionals



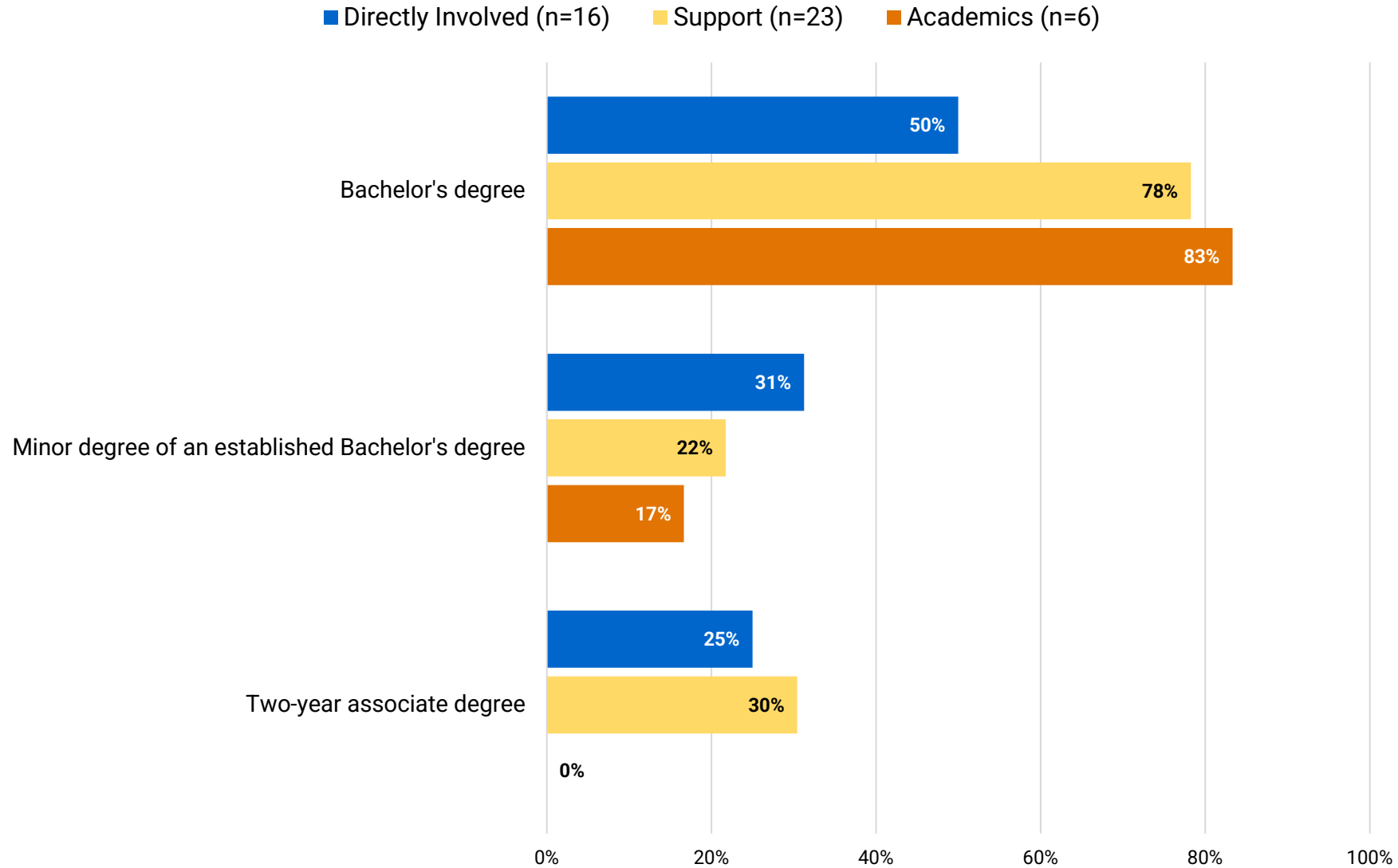
Marketing Specialist: Skills Needed

According to Industry Professionals



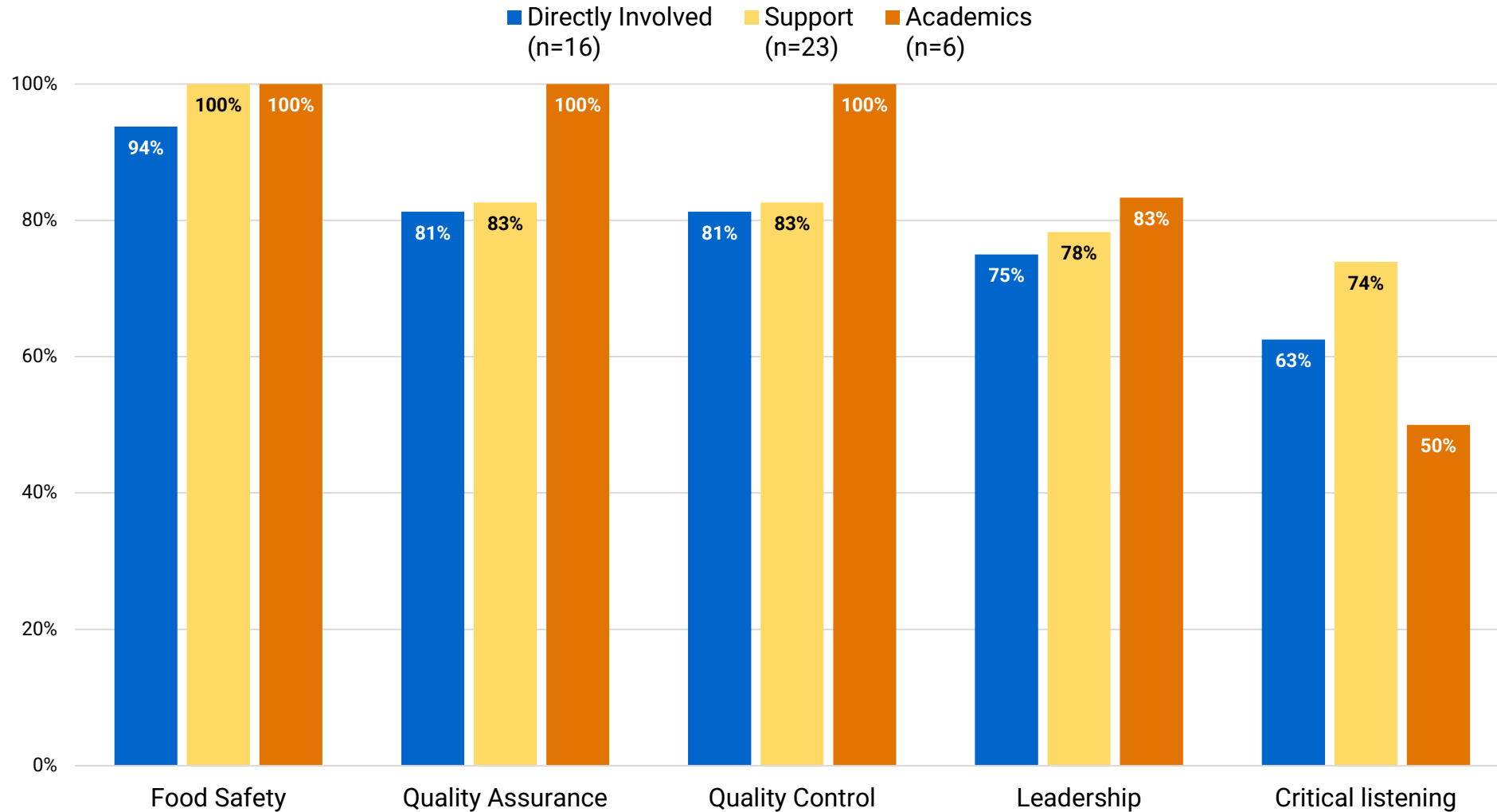
Marketing Specialist: Degree Needed

According to Industry Professionals



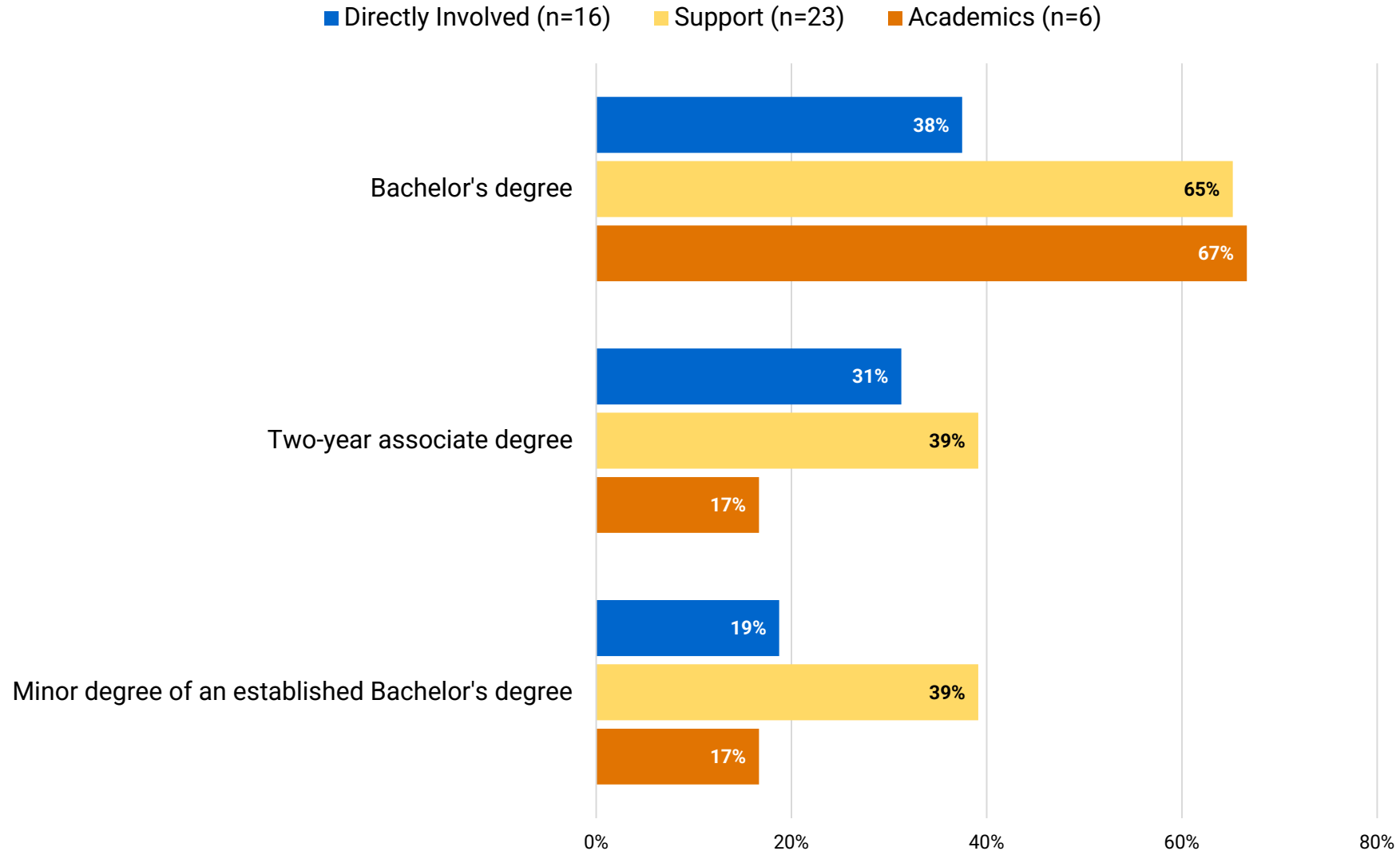
Food Safety Coordinator: Skills Needed

According to Industry Professionals



Food Safety Coordinator: Degree Needed

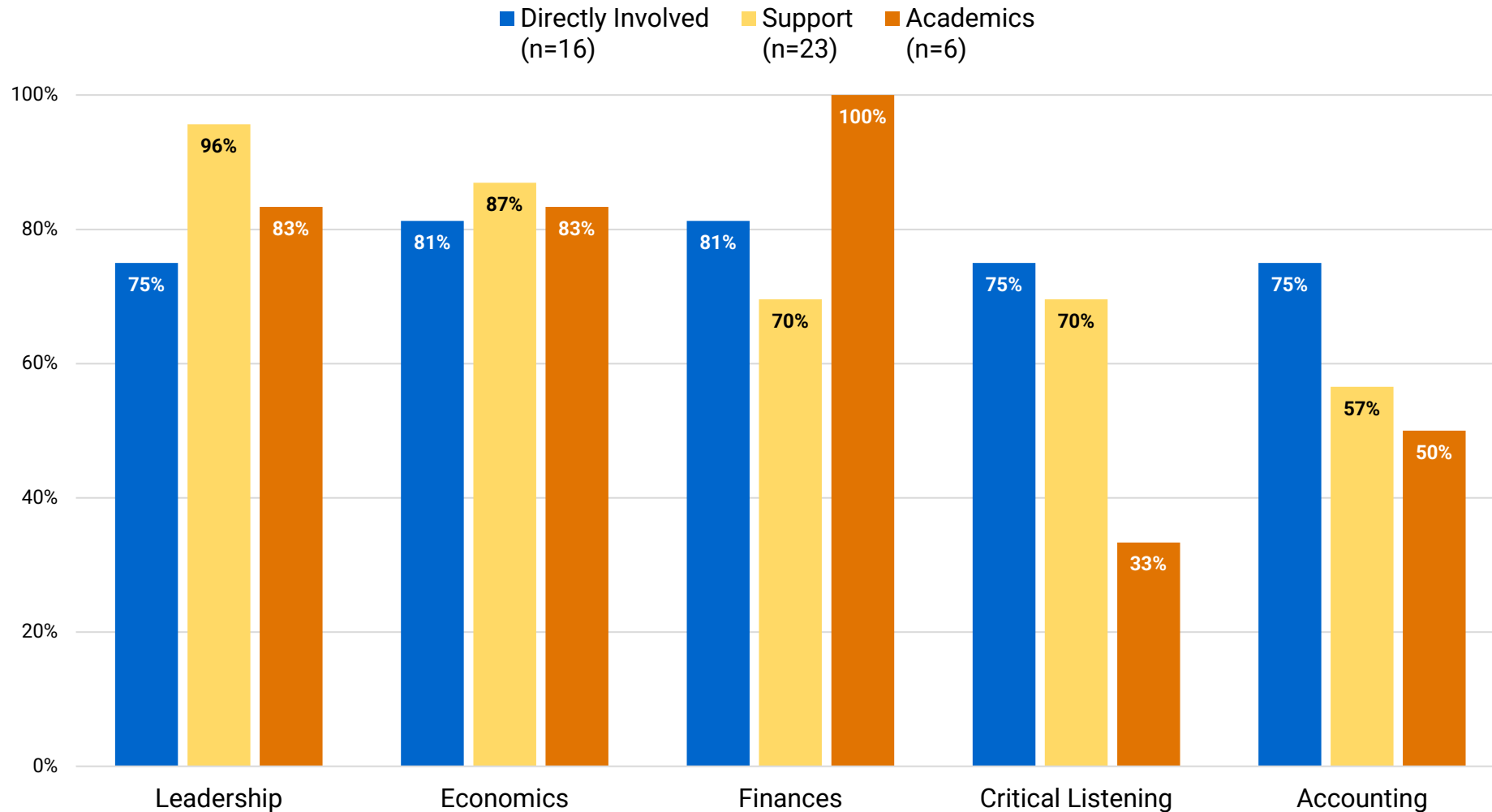
According to Industry Professionals



*Top 3 responses displayed

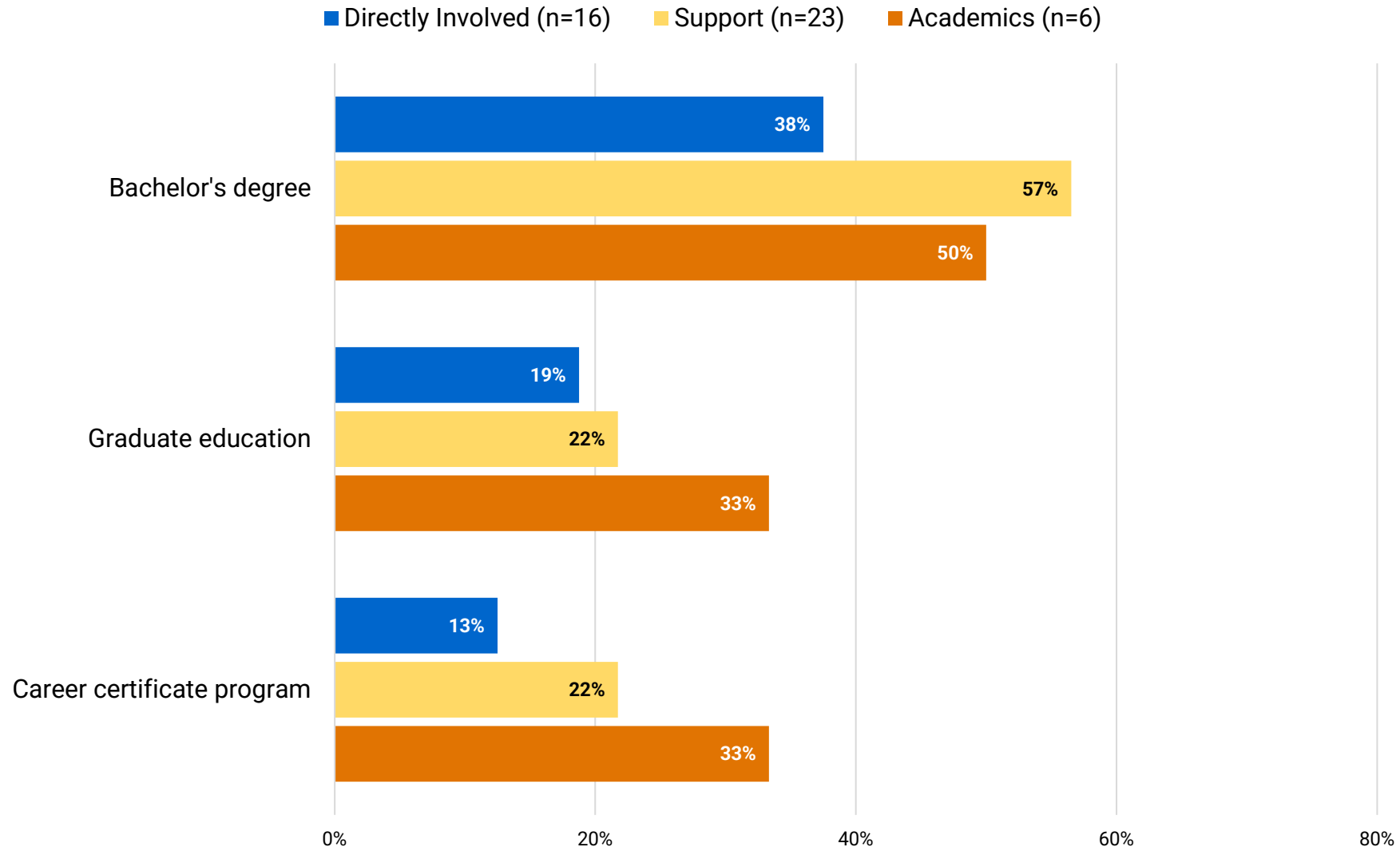
CEA Entrepreneur / Investor: Skills Needed

According to Industry Professionals



CEA Entrepreneur / Investor: Degree Needed

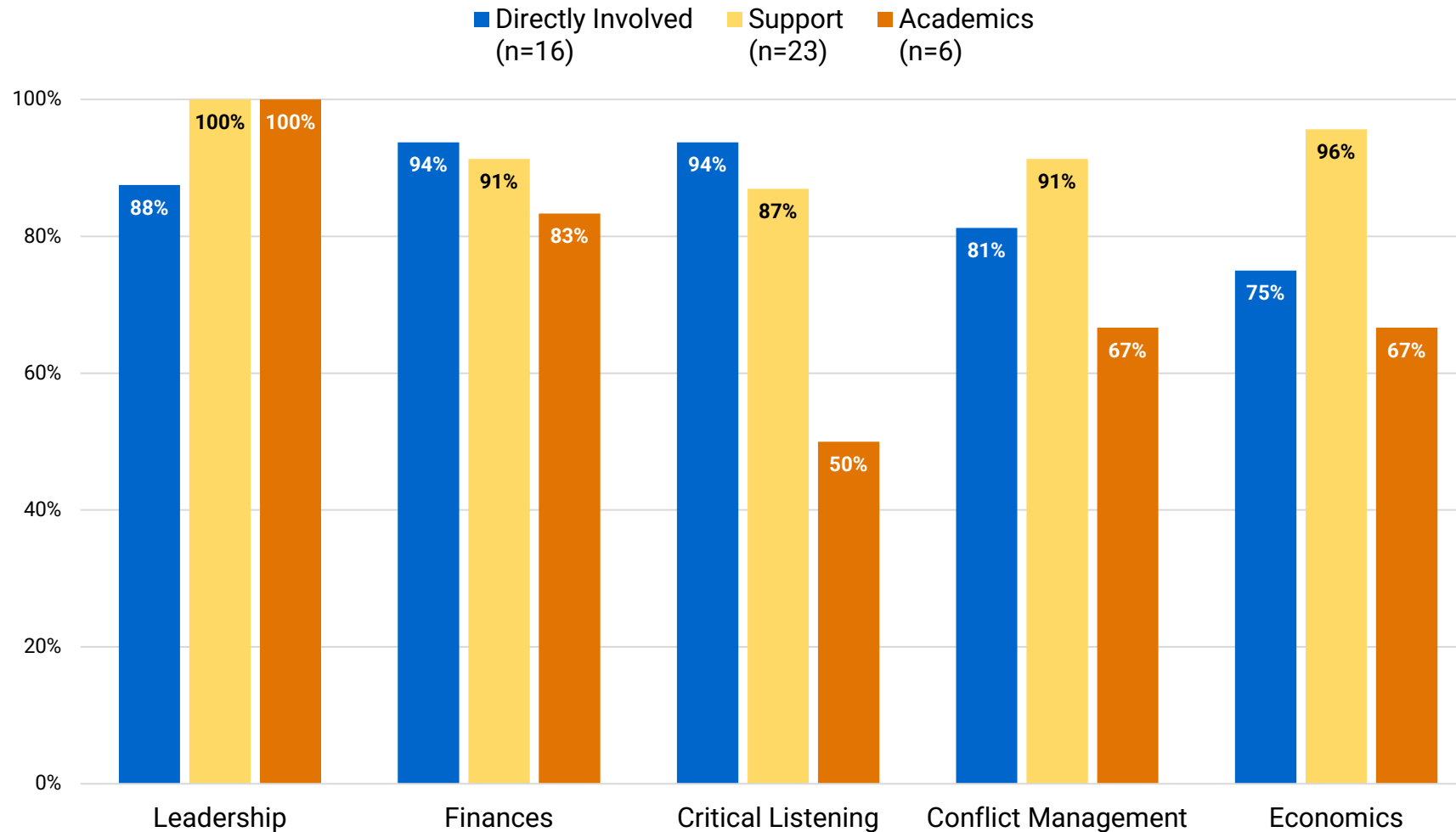
According to Industry Professionals



*Top 3 responses displayed

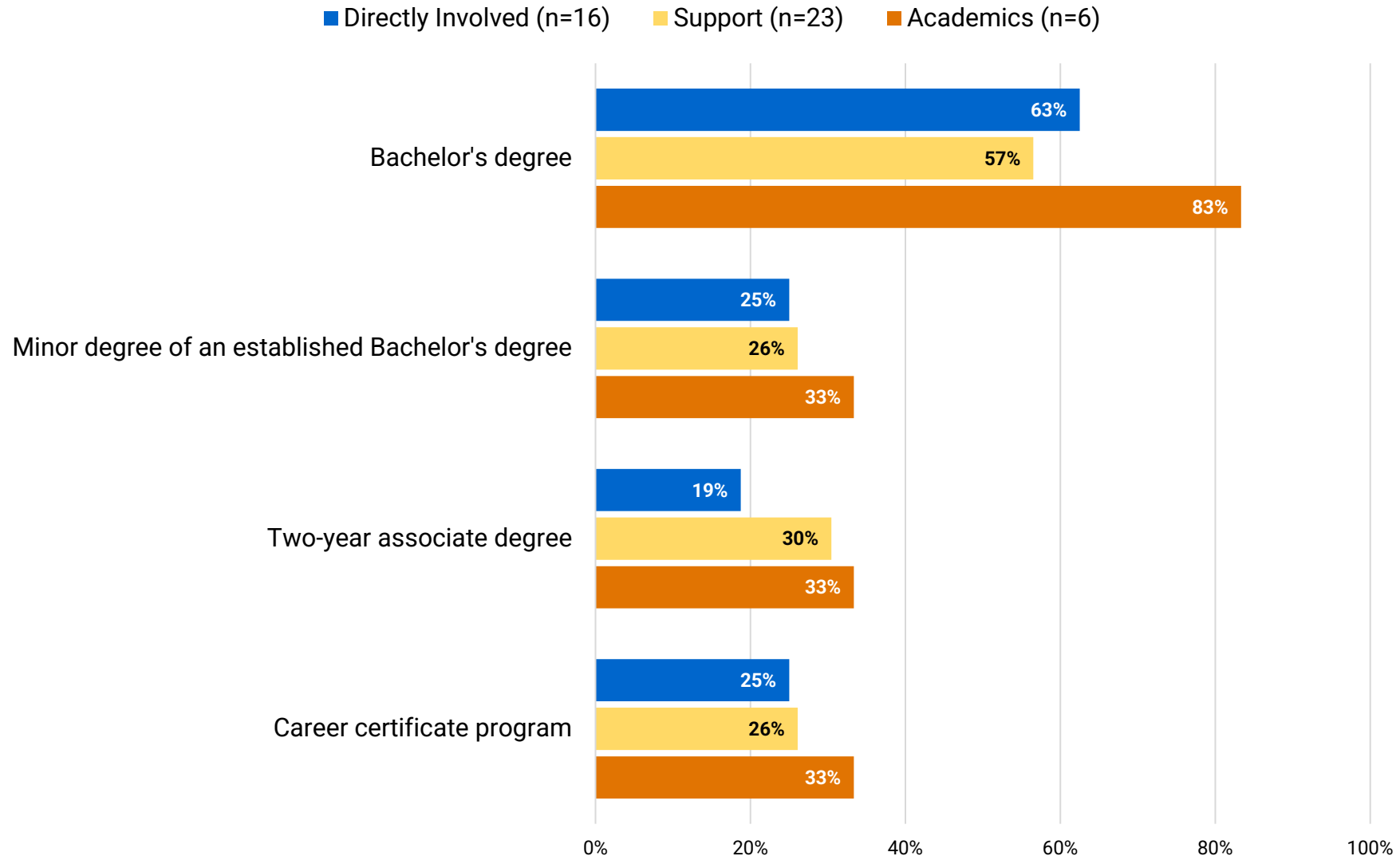
Farm Owner: Top 5 Skills Needed

According to Industry Professionals



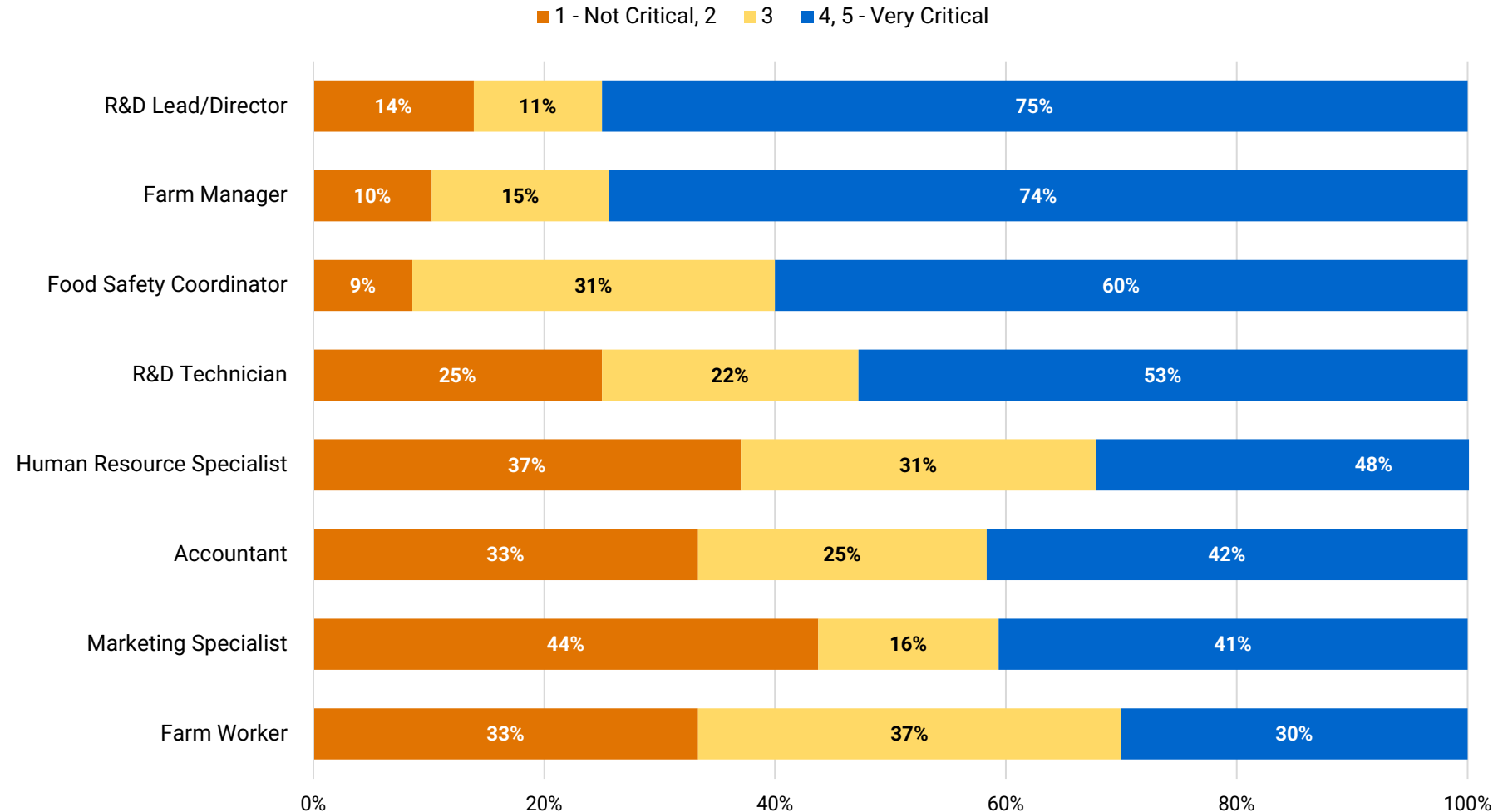
Farm Owner: Degree Needed

According to Industry Professionals



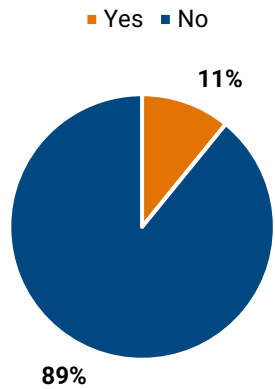
Knowledge/Skill	Farm worker	Farm manager	R&D technician	R&D director	Marketing specialist	Food safety director	CEA entrepreneur /investor	Farm owner
Food safety	•	•	×	×	•	•	×	×
Basic plant physiology	•	•	•	×	×	×	×	×
Advanced plant physiology	×	×	•	•	×	×	×	×
IPM	•	×	×	×	×	×	×	×
Quality control	•	•	×	×	×	•	×	×
Quality assurance	•	×	×	×	×	•	×	×
Leadership	×	•	×	•	•	•	•	•
Conflict management	×	•	×	×	×	×	×	•
Experimental design & data analytics	×	×	•	•	×	×	×	×
Statistics	×	×	•	•	×	×	×	×
Basic chemistry	×	×	•	×	×	×	×	×
Critical listening	×	×	×	•	×	•	•	•
Marketing	×	×	×	×	•	×	×	×
Advertising	×	×	×	×	•	×	×	×
Logistics	×	×	×	×	•	×	×	×
Economics	×	×	×	×	×	×	•	•
Finance	×	×	×	×	×	×	•	•
Accounting	×	×	×	×	×	×	•	×
Degree	Apprenticeship or Certificate	2-year associate or BSc	2-year associate or BSc	Graduate or BSc	BSc or Minor	BSc or 2-year associate	BSc or Graduate	BSc or Minor

Do industry professionals feel internships or apprenticeships are necessary prior to hiring someone in the following CEA positions?

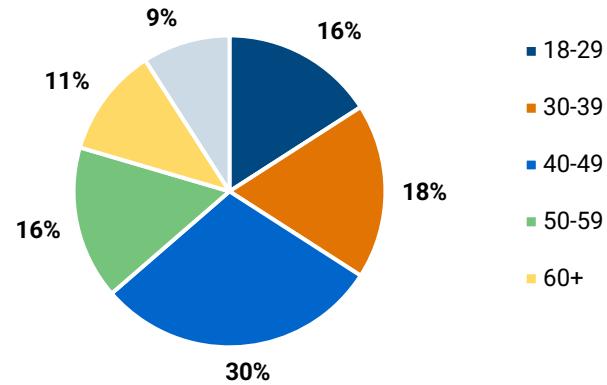


Demographics

Veteran Status (n=46)



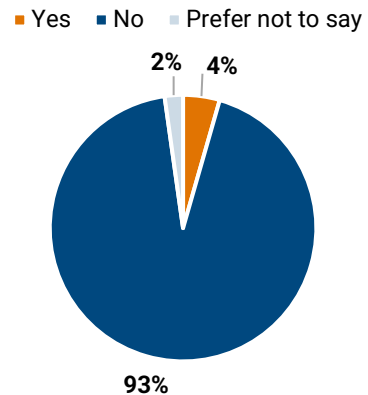
Age (n=44)



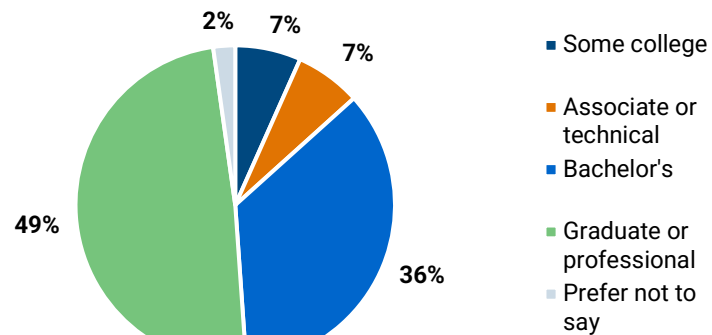
Race/Ethnicity (n=44)



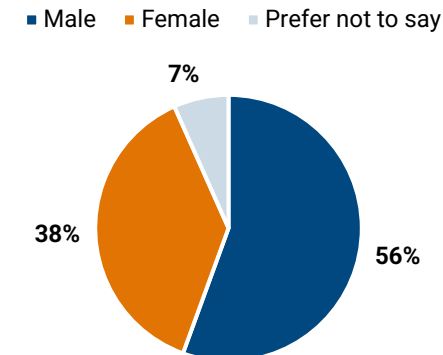
Disability Status (n=45)



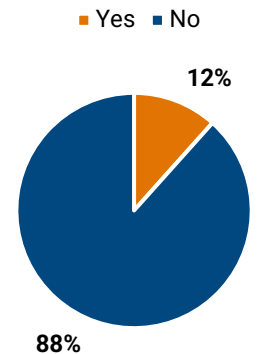
Highest Level of Education (n=45)



Gender Identity (n=45)



Hispanic/Latinx (n=43)





CEA Curriculum Needs Assessment:

Student Survey

Survey Description

This survey was given to students at the University of Missouri-Kansas City (UMKC), with the goals of identifying student interested in farming and Controlled Environmental Agriculture (CEA), in addition to gaining information to help develop curriculum and training tracks for a CEA minor.

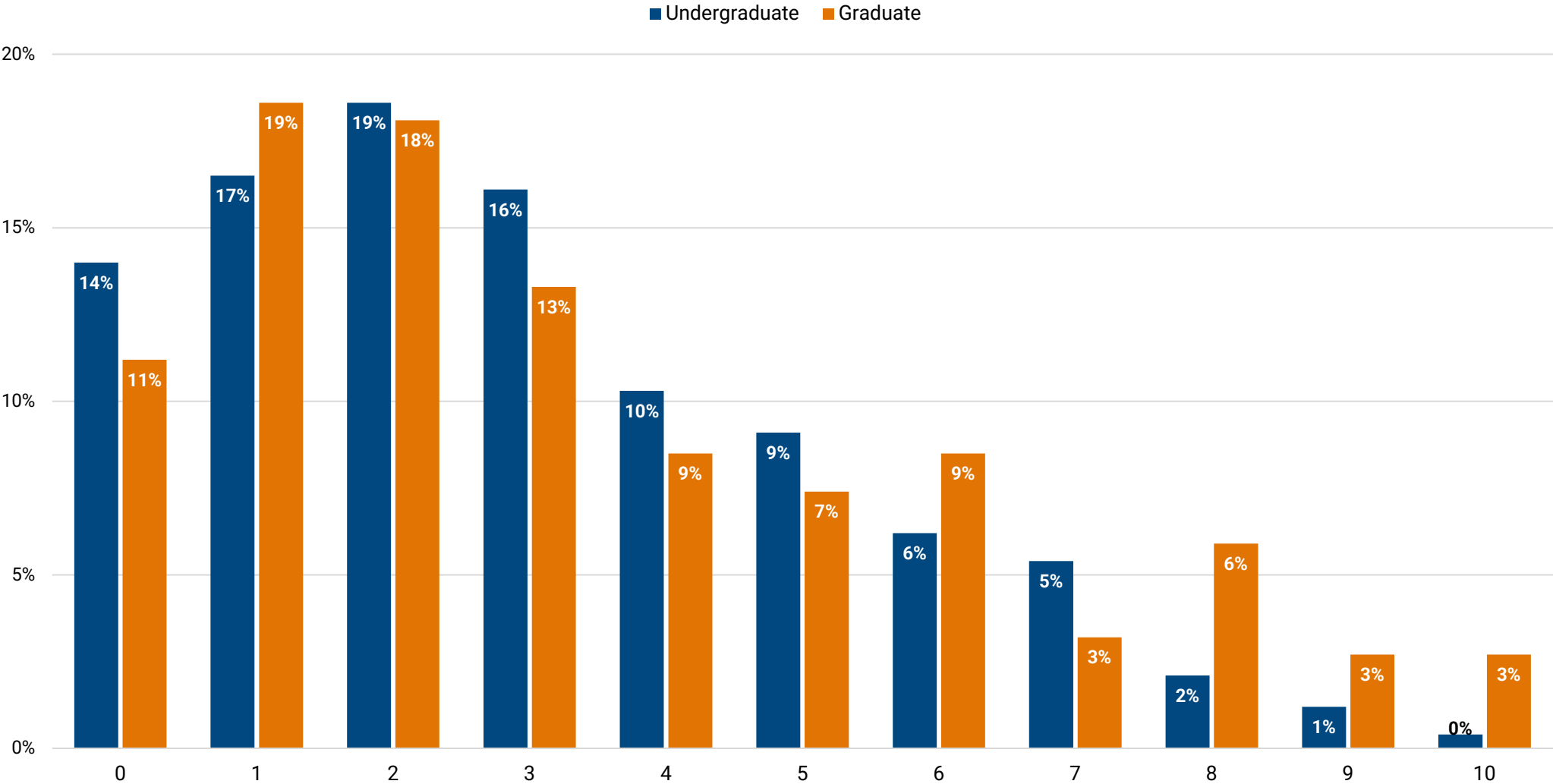
Respondents were split into categories based on their academic level, **undergraduate** or **graduate**.

Students were asked about **skills** they would be interested in developing as part of a CEA minor. They selected from a list of 20.

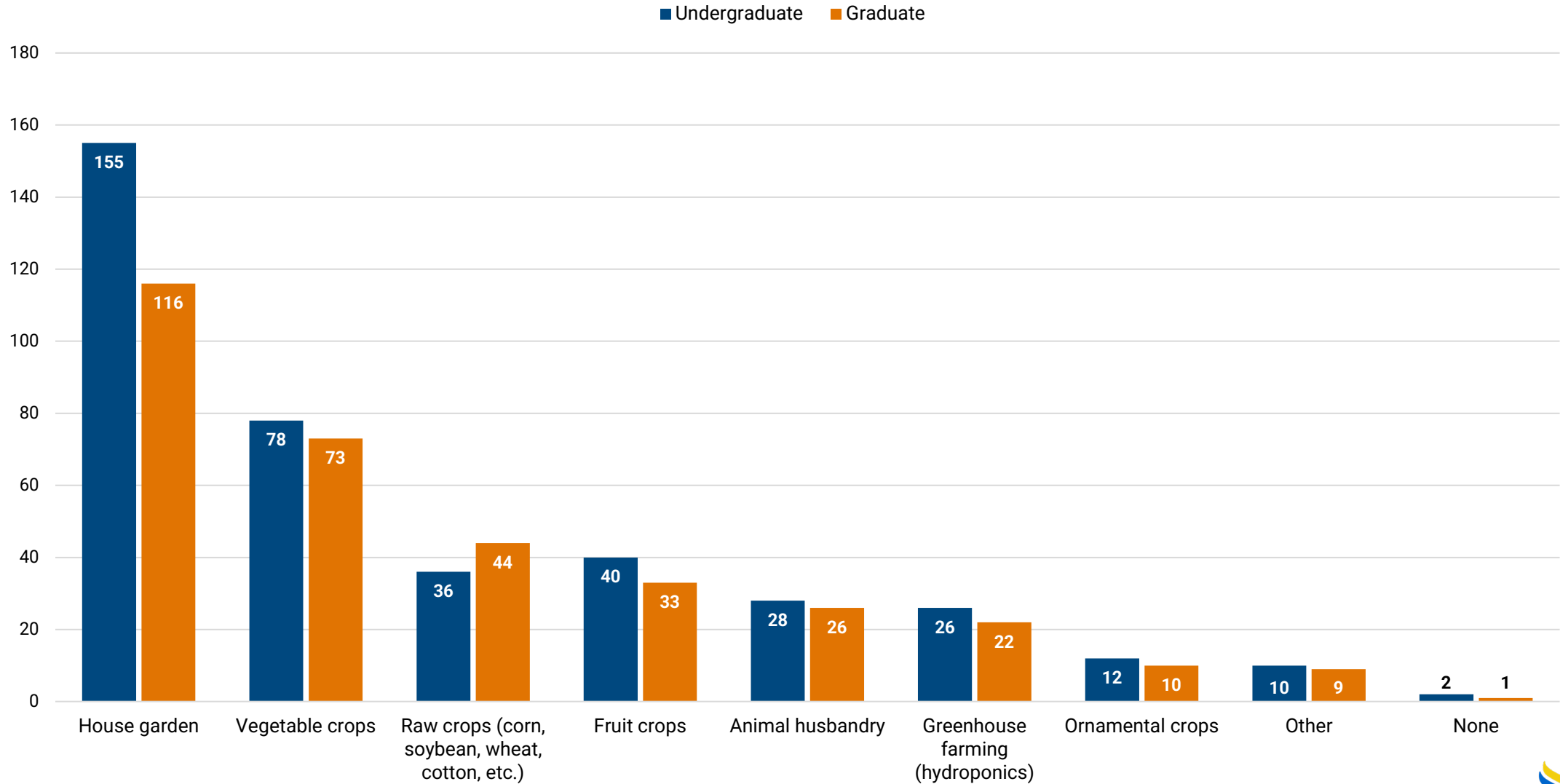
- Food safety
- Integrated pest management
- Programming and coding
- Basic chemistry
- Basic plant physiology
- Advanced plant physiology
- Statistics
- Experimental design and data analysis
- Leadership
- Logistics
- Finances
- Accounting
- Marketing
- Quality Control
- Human Resource Management
- Economics
- Conflict Management
- Advertising
- Entrepreneurship
- Other (please specify)

Agricultural Experience

0 – no experience, 10 – I’m an expert



Type of Agricultural Experience



Experience and Interest

37% of undergraduate students and **51%** of graduate students have experience in gardening.

53% of students are familiar with the concept of Controlled Environmental Agriculture (CEA).

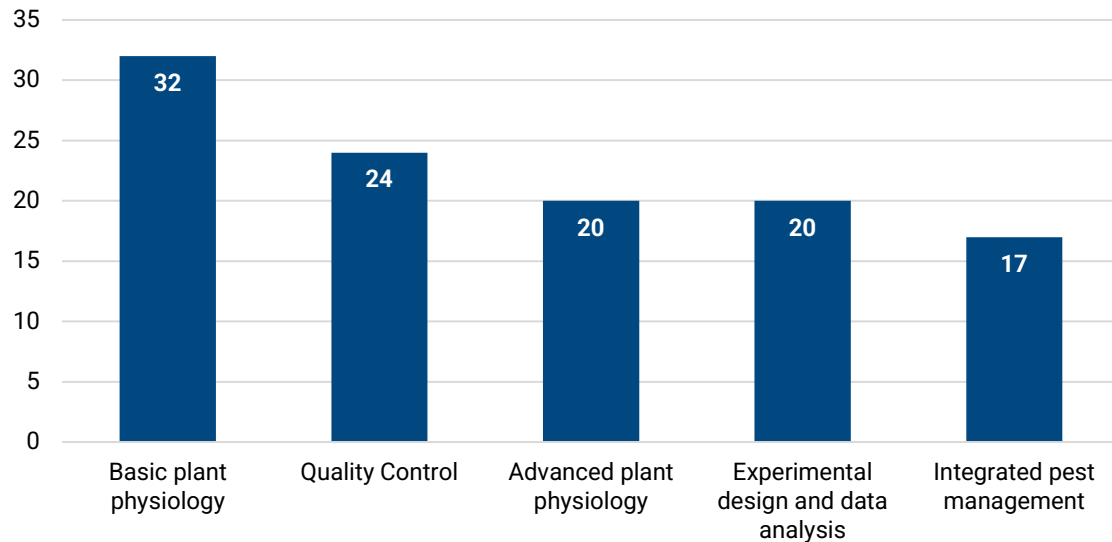
3% of undergraduate students and **1%** of graduate students have participated in UMKC's gardening club.

89% of UMKC students are interested in a lab or greenhouse where they can participate in growing crops.

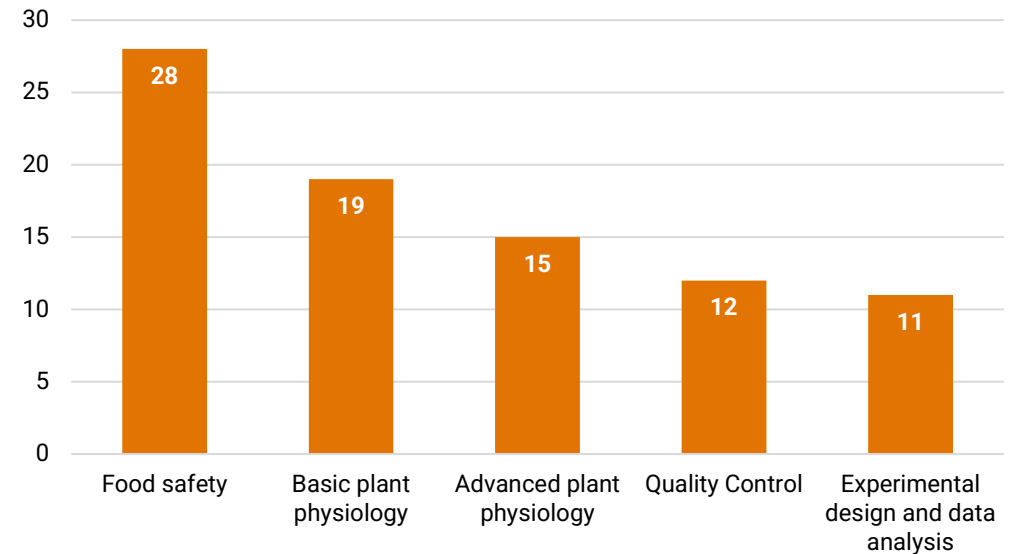
53% of UMKC students are interested, or would consider participating in, an academic minor for Controlled Environment Agriculture

Top 5 Skills Students Want to Develop

Skills undergraduates would like to see in a CEA curriculum:



Skills graduates would like to see in a CEA curriculum:



Where they overlap:

Basic plant physiology, advanced plant physiology and quality control are important for both groups.

What about CEA is intriguing to you?

“CEA has the potential to produce high-quality food close to consumers using minimal water and other resources.”

“The ability for entrepreneurs to transform unused urban facilities into farms that aren’t resource intensive and close to the consumer.”

“It is an alternative to help protect the environment by taking control of a particular area and reducing the pesticide and other chemicals used.”

“It is interesting to study about creating an ecosystem for plants to grow.”

“I believe we need to shift out local communities’ focus to sustainable and equitable farming that can provide an abundance for everyone, in, around, and beyond itself.”

Project Summary:

- 40+% of industry respondents believe internships or apprenticeships are necessary for positions beyond the entry level farm worker
- Knowledge/skill areas can help inform professional development priorities within job categories
- Top skills/academics listed by position should be reviewed by industry members to recruit quality candidates
- Over half of all UMKC students (urban, non-agriculture institution) are interested in CEA as an academic program
- Over half of all UMKC students are familiar with CEA
- Almost 90% of UMKC students are interested in growing crops on campus

Do you want to contribute to our research?

Please scan this QR code to complete
our survey for industry professionals!

