



United Nations
Educational, Scientific and
Cultural Organization



**WORLD
ENGINEERING
DAY**

2020 World Engineering Day

2nd ANNUAL GLOBAL SURVEY RESULTS

Executive Summary: March 4, 2020



The 2nd Annual Global Survey

DiscoverE launched Global Day of the Engineer in 2016 and completed the first-ever global survey in 2019. For 2020, DiscoverE joined forces with WFEO and UNESCO to coordinate World Engineering Day for Sustainable Development. As part of this celebration, we launched a second survey to explore the future of engineering, asking about daunting global challenges, our ability to solve these challenges and what factors might limit us.

Methodology & Background

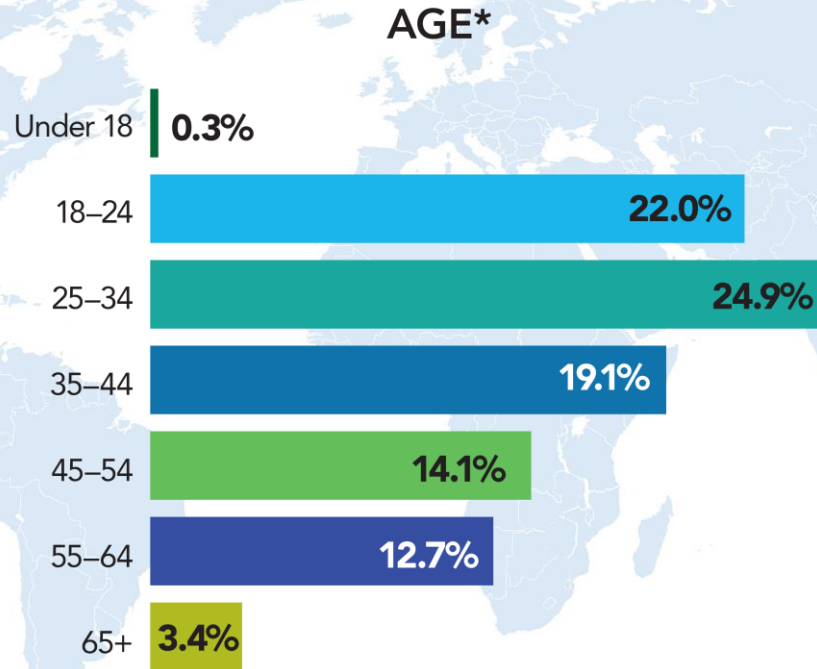
- The 2nd annual Global Engineer Survey was developed by DiscoverE in collaboration with our partners at WFEO and Concord Evaluation Group. The online survey launched on November 11, 2019 and closed on January 17, 2020.
- To ensure the highest levels of participation, DiscoverE asked coalition partners around the world to help spread the word.
- The 12-question survey was administered through Survey Monkey and was available in six languages (English, Spanish, Chinese, Arabic, Russian, French).
- The survey findings were shared on March 4, 2020—World Engineering Day.
- We cross-tabulated select questions by country and discipline.

Study Participants

10,077 Participants

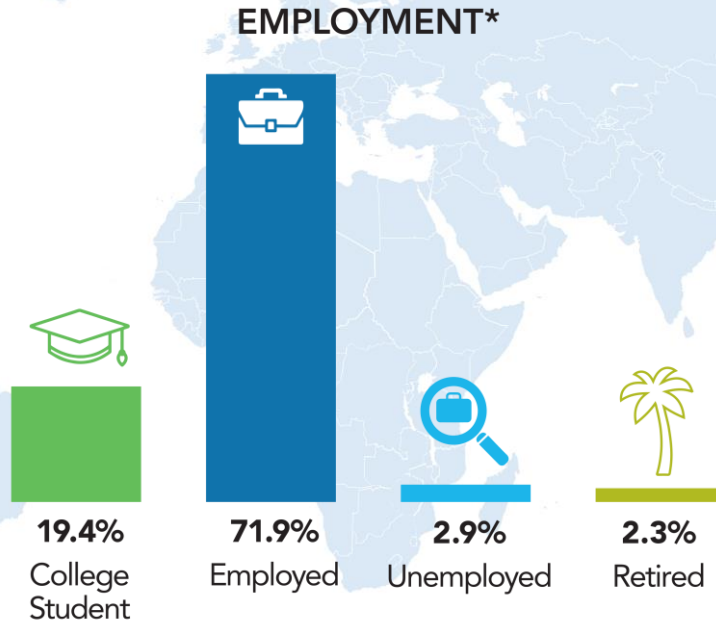
- 82% Engineers (8,232)
- 8% Technologists (813)
- 7% Technicians (705)
- 3% None of the above (327)

Study Participants



**Missing data from 3.5% of respondents.*

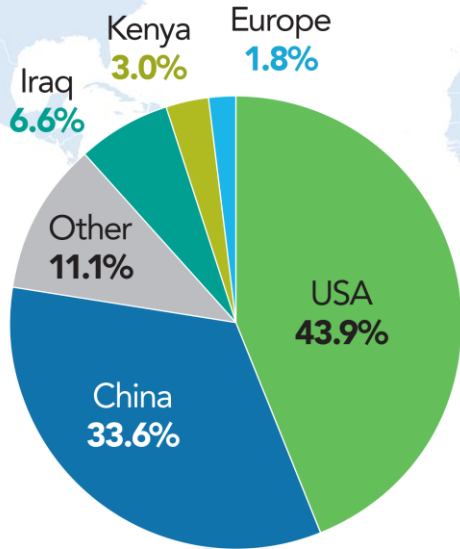
Study Participants



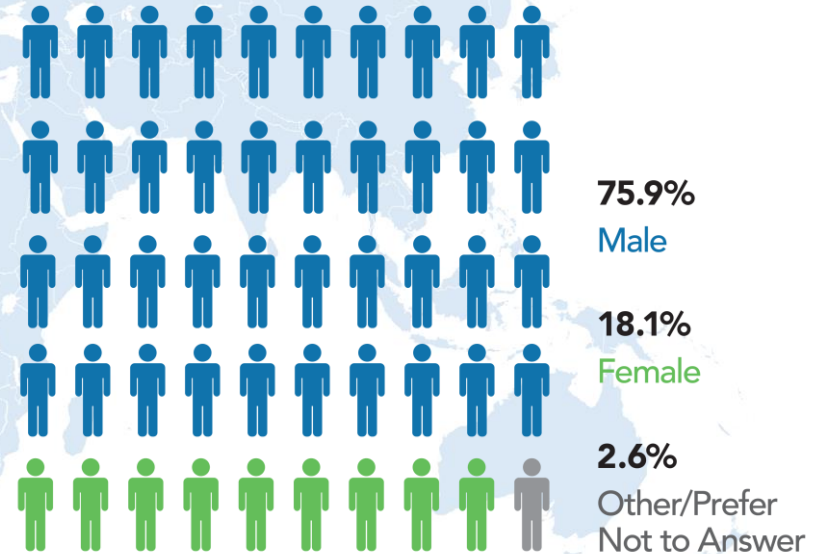
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Study Participants

TOP PARTICIPATING COUNTRIES/REGIONS



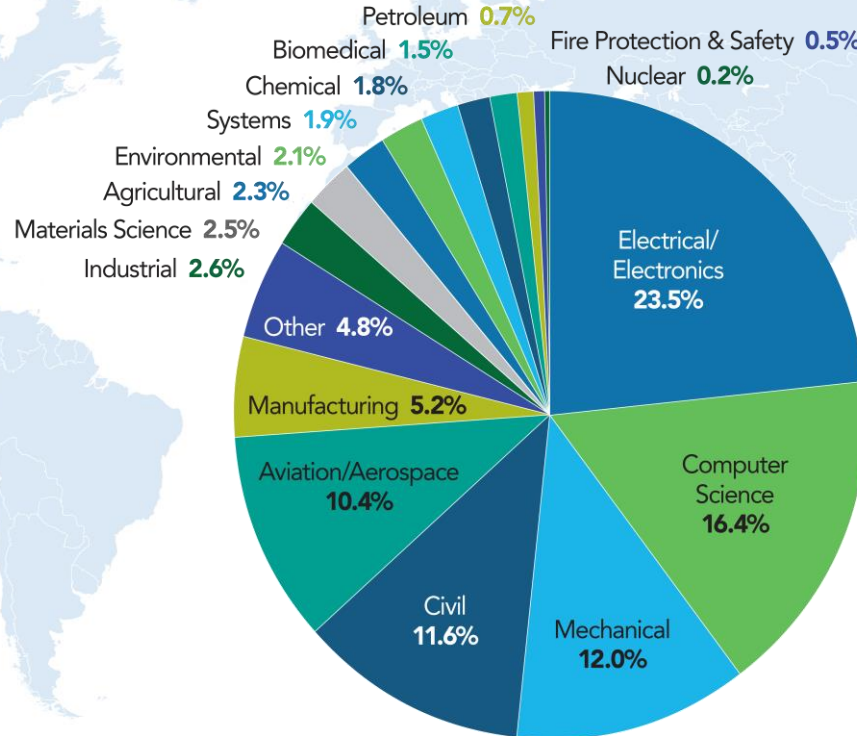
GENDER*



*Missing data from 3.5% of respondents.

Study Participants

ENGINEERING DISCIPLINE



What Is the Most Daunting Global Challenge We Will Face in the Next 25 Years?



1.	Securing Cyberspace	19%
2.	Economical Clean Energy	18%
3.	Sustaining Lands and Oceans	16%
4.	Sustainable and Resilient Infrastructure	11%
5.	Sustainable Cities	9%
6.	Access to Clean Water and Sanitation	8%
7.	Clean Air	8%
8.	Food Security	4%
9.	Preparing and Containing Pandemics	4%
10.	Developing and Delivering Better Medicines	4%

Note: The survey was administered from 11/2019 to 1/17/2020, before the current coronavirus outbreak made international news

By Respondent's Country: Top Two Global Challenges

USA

- 1. Securing Cyberspace 27%
- 2. Sustaining Lands and Oceans 17%

China

- 1. Sustaining Lands and Oceans 20%
- 2. Economical Clean Energy 18%

Europe

- 1. Economical Clean Energy 25%
- 2. Sustaining Lands and Oceans 16%

By Respondent's Country: Top Two Global Challenges

Iraq

1. Economical Clean Energy 25%
2. Clean Air 18%

Kenya

1. Access to Clean Water 23%
2. Sustainable Cities 20%

All Others

1. Sustaining Lands and Oceans 18%
2. Economical Clean Energy 17%

By Respondent's Discipline: Top Two Global Challenges

Aviation/Aerospace

- | | | |
|----|----------------------------|-----|
| 1. | Securing Cyberspace | 27% |
| 2. | Sustaining Land and Oceans | 18% |

Civil

- | | | |
|----|--|-----|
| 1. | Sustainable and Resilient Infrastructure | 21% |
| 2. | Sustainable Cities | 18% |

Computer Science

- | | | |
|----|----------------------------|-----|
| 1. | Securing Cyberspace | 31% |
| 2. | Sustaining Land and Oceans | 16% |

By Respondent's Discipline: Top Two Global Challenges

Electrical

- | | | |
|----|-------------------------|-----|
| 1. | Securing Cyberspace | 20% |
| 2. | Economical Clean Energy | 20% |

Mechanical

- | | | |
|----|----------------------------|-----|
| 1. | Economical Clean Energy | 25% |
| 2. | Sustaining Land and Oceans | 16% |

All Others

- | | | |
|----|----------------------------|-----|
| 1. | Sustaining Land and Oceans | 18% |
| 2. | Economical Clean Energy | 17% |

By Respondent's Job Title & Gender: How Optimistic Are You That the Engineering Community Can Solve These Challenges?

By Job Title

- Technologists 67.55
- Technicians 65.11
- Engineers 60.90

By Gender

- Men 63.78
- Women 56.52

**Respondents were asked to rate their optimism level on a scale from 1 to 100.*

By Respondent's Age and Employment: How Optimistic Are You?

By Age

- 18 – 24 66.22
- 25 – 34 59.43
- 35 – 64 62.00
- Over 65 60.65

By Employment Status

- College Student 69.42
- Employed 60.40
- Retired 61.02
- Unemployed 57.19

**Respondents were asked to rate their optimism level on a scale from 1 to 100.*

By Challenge: How Optimistic Are You?



• Developing and Delivering Better Medicines	64.58
• Securing Cyberspace	64.21
• Economical Clean Energy	64.01
• Sustainable and Resilient Infrastructure	62.89
• Sustainable Cities	63.28
• Access to Clean Water and Sanitation	61.40
• Clean Air	60.96
• Food Security	60.32
• Preparing and Containing Pandemics	58.97
• Sustaining Lands and Oceans	56.92

**Respondents were asked to rate their optimism level on a scale from 1 to 100.*

What Are the Limiting Factors to Solving These Challenges?

- Necessary support from government & policy makers is lacking 29.3%
- Necessary technologies have not yet been developed 13.3%
- Lack of interdisciplinary collaboration & international cooperation 12.5%
- Not enough public support for innovative engineering solutions 9.8%
- Lack of funding 9.7%
- Not enough engineers & technical professionals to address the issue 7.0%
- Lack of diversity in the workforce 4.9%
- Don't know 4.7%
- Other 4.5%
- Day-to-day work pressures 4.3%

By Respondent's Discipline: Top Two Limiting Factors

Aviation/Aerospace

- Necessary support from government & policy makers is lacking 36%
- Necessary technologies have not yet been developed 12%

Civil

- Necessary support from government & policy makers is lacking 35%
- Lack of funding 13%

Computer Science

- Necessary support from government & policy makers is lacking 25%
- Necessary technologies have not yet been developed 15%

By Respondent's Discipline: Top Two Limiting Factors

Electrical

- Necessary support from government & policy makers is lacking 26%
- Necessary technologies have not yet been developed 16%

Mechanical

- Necessary support from government & policy makers is lacking 29%
- Necessary technologies have not yet been developed 14%

All others

- Necessary support from government & policy makers is lacking 30%
- Lack of interdisciplinary collaboration & international cooperation 13%

By Respondent's Country: Top Two Limiting Factors

USA

- Necessary support from government & policy makers is lacking 34%
- Lack of funding 12%

China

- Necessary technologies have not yet been developed 21%
- Necessary support from government & policy makers is lacking 16%

Europe

- Necessary support from government & policy makers is lacking 34%
- Lack of interdisciplinary collaboration & international cooperation 15%

By Respondent's Country: Top Two Limiting Factors

Iraq

- Necessary support from government & policy makers is lacking 45%
- Not enough public support support for innovative engineering 10%

Kenya

- Necessary support from government & policy makers is lacking 45%
- Lack of Interdisciplinary collaboration & international cooperation 19%

All Others

- Necessary technologies have not yet been developed 36%
- Lack of Interdisciplinary collaboration & international cooperation 15%

Shortage of Engineers

There is a current shortage of engineers

- Agree or strongly agree 51.7%
- Neutral 29.1%
- Disagree or strongly disagree 19.2%

There will be a shortage of engineers in the future

- Agree or strongly agree 54.3%
- Neutral 24.4%
- Disagree or strongly disagree 21.3%

By Respondent's Country: Shortage of Engineers

There is a current shortage of engineers*

- USA 3.60
- China 3.44
- Europe 3.50
- Kenya 3.38
- Iraq 2.50
- All others 3.10

There will be a shortage of engineers in the future*

- USA 3.67
- China 3.42
- Europe 3.70
- Kenya 3.29
- Iraq 2.51
- All others 3.16

*Answers on a 5-point scale, with 1 being strongly disagree, 3 being agree and 5 being strongly agree.

By Respondent's Job Title: Shortage of Engineers

There is a current shortage of engineers*

- Engineers 3.38
- Technologists 3.61
- Technicians 3.48

There will be a shortage of engineers in the future*

- Engineers 3.42
- Technologists 3.65
- Technicians 3.45

*Answers on a 5-point scale, with 1 being strongly disagree, 3 being agree and 5 being strongly agree.

By Discipline: Shortage of Engineers

There is a current shortage of
Engineers*

- Aviation 3.72
- Civil 3.10
- Computer 3.51
- Electrical 3.40
- Mechanical 3.22
- All others 3.44

There will be a shortage of
engineers in the future*

- Aviation 3.82
- Civil 3.15
- Computer 3.49
- Electrical 3.42
- Mechanical 3.30
- All others 3.48

*Answers on a 5-point scale, with 1 being strongly disagree, 3 being agree and 5 being strongly agree.

Shortage of Technicians & Technologists

There is a current shortage of technicians & technologists

- Agree or strongly agree 60.3%
- Neutral 26.7%
- Disagree or strongly disagree 13.1%

There will be a shortage of engineers in the future

- Agree or strongly agree 58.0%
- Neutral 27.3%
- Disagree or strongly disagree 14.7%

By Respondent's Country: Shortage of Technicians & Technologists

There is a current shortage of engineers*

- USA 3.67
- China 3.77
- Europe 3.72
- Kenya 3.48
- Iraq 3.04
- All others 3.35

There will be a shortage of engineers in the future*

- USA 3.69
- China 3.67
- Europe 3.81
- Kenya 3.48
- Iraq 3.00
- All others 3.37

*Answers on a 5-point scale, with 1 being strongly disagree, 3 being agree and 5 being strongly agree.

By Respondent's Job Title: Shortage of Shortage of Technicians & Technologists

There is a current shortage of technicians and technologists*

- Engineers 3.58
- Technologists 3.89
- Technicians 3.77

There will be a shortage of technicians and technologists in the future*

- Engineers 3.56
- Technologists 3.87
- Technicians 3.67

*Answers on a 5-point scale, with 1 being strongly disagree and 5 being strongly agree.

By Respondent's Discipline: Shortage of Technicians and Technologists

There is a current shortage of technicians and technologists*

- Aviation 3.76
- Civil 3.51
- Computer 3.59
- Electrical 3.62
- Mechanical 3.57
- All others 3.67

There will be a shortage of technicians and technologists in the future*

- Aviation 3.81
- Civil 3.47
- Computer 3.52
- Electrical 3.59
- Mechanical 3.57
- All others 3.64

*Answers on a 5-point scale, with 1 being strongly disagree and 5 being strongly agree.

How Important Is it to Volunteer with Students?

All Respondents

- Not important 4.1%
- Important 48.4%
- Very important 47.4%

By Respondent's Country & Discipline: How Important Is it to Volunteer with Students?

By Country

- USA 2.45
- China 2.39
- Europe 2.39
- Kenya 2.78
- Iraq 2.37
- All others 2.46

By Discipline

- Aviation 2.44
- Civil 2.48
- Computer 2.38
- Electrical 2.43
- Mechanical 2.42
- All others 2.46

**Answers on a 3-point scale, with 1 being not important and 3 being very important.*

From science fiction dreams to engineering reality in the next 25 years.

Survey respondents felt **space travel**, **artificial intelligence** and **transportation** will be the top areas to see science fiction-like advances.

- *In the next 25 years, service robots programmed with artificial intelligence will be commercialized and popularized. Technologies such as self-driving vehicles and automatic crop monitoring will be standardized.*
- *Personal space travel is coming. Just as Henry Ford introduced automated assembly lines to make cars affordable for the common man, someone will do that for space ships.*
- *Solar-power planes will carry commercial passengers, green energy will be at cost parity or better with conventional carbon-based energy, and energy efficient high-speed rail will overtake flying for domestic travel and daily commuting. .*

2020 Global Engineer Survey Results

For more information about
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