2016 BRT Education and Workforce Survey
Results and Analysis

Business RoundtableSM

Prepared By:
Business Roundtable

June 2017

Summary of Key Results

BRT surveyed 177 member companies on workforce talent, including the extent to which they can hire employees with specific skills for key occupations. Approximately 50% of member companies participated.

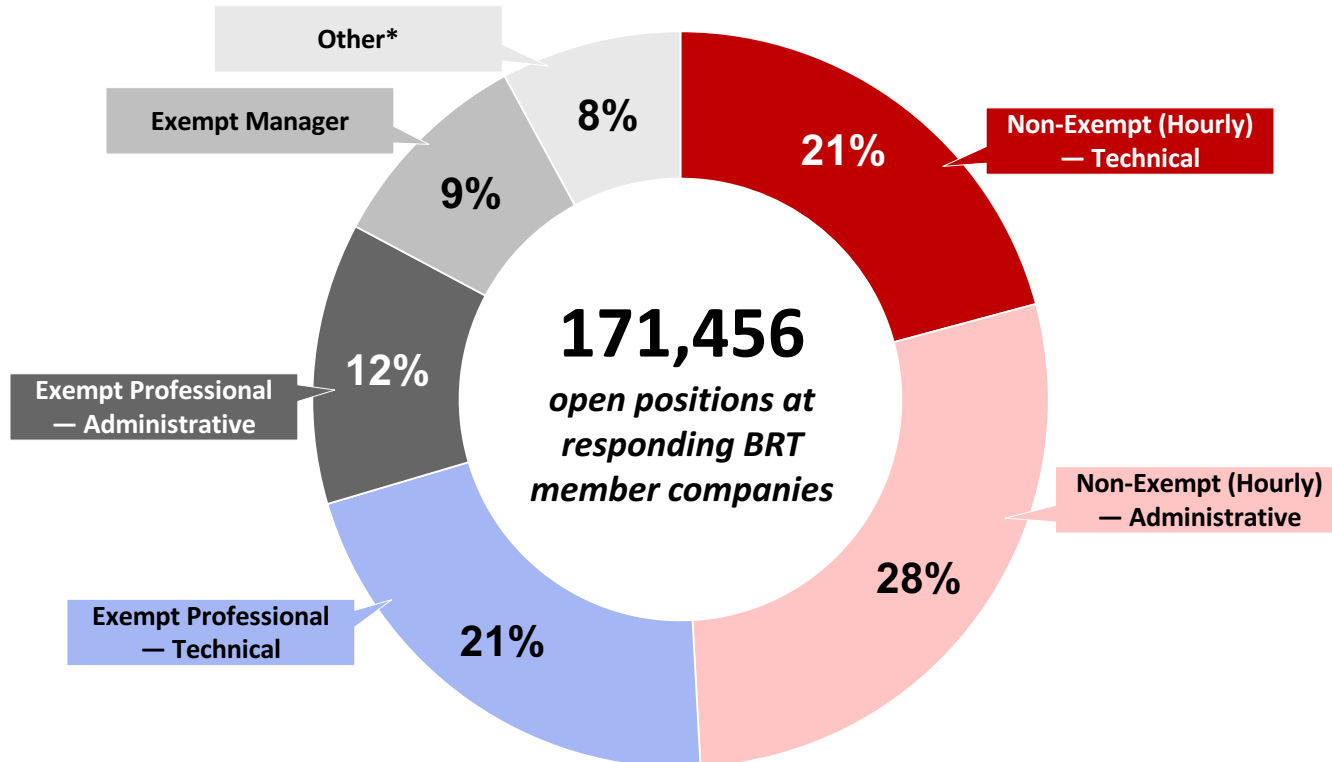|		
1	**Talent Gaps Exist Across Industries**	Only 5% of companies reported that finding the talent they need was not at least somewhat problematic.
2	**Talent Gaps Exist Across Skill Categories**	STEM-specific skills, general applied knowledge, and workplace skills. Critical thinking / problem-solving and teamwork data analytics and cybersecurity expertise.
3	**Identifying Qualified and Diverse Applicants Remains a Challenge**	Most companies struggle to hire qualified candidates with diverse racial, ethnic, and gender qualities.
4	**Similar Recruitment Techniques Are Used for Most Occupations**	Most members recruit from 4-year colleges and universities and community colleges. Companies also rely on employee referrals, apprentice / intern programs, and social media.
5	**Firms Invest Heavily to Close Talent Gaps**	BRT respondents invest a combined $4.5 billion per year in employee learning and development programs to mitigate talent gaps — and this investment is likely to increase in future years.

Responding member companies have more than 171,000 open positions in the United States.

Q Please estimate the percentage of your company's U.S. job openings (as of June 2016) that belong in the categories listed below.

Percent of BRT Open Positions in the U.S.

171,456 *open positions at responding BRT member companies*

- Non-Exempt (Hourly) — Technical: 21%
- Non-Exempt (Hourly) — Administrative: 28%
- Exempt Professional — Technical: 21%
- Exempt Professional — Administrative: 12%
- Exempt Manager: 9%
- Other*: 8%

Responses: n = 70 total responses;
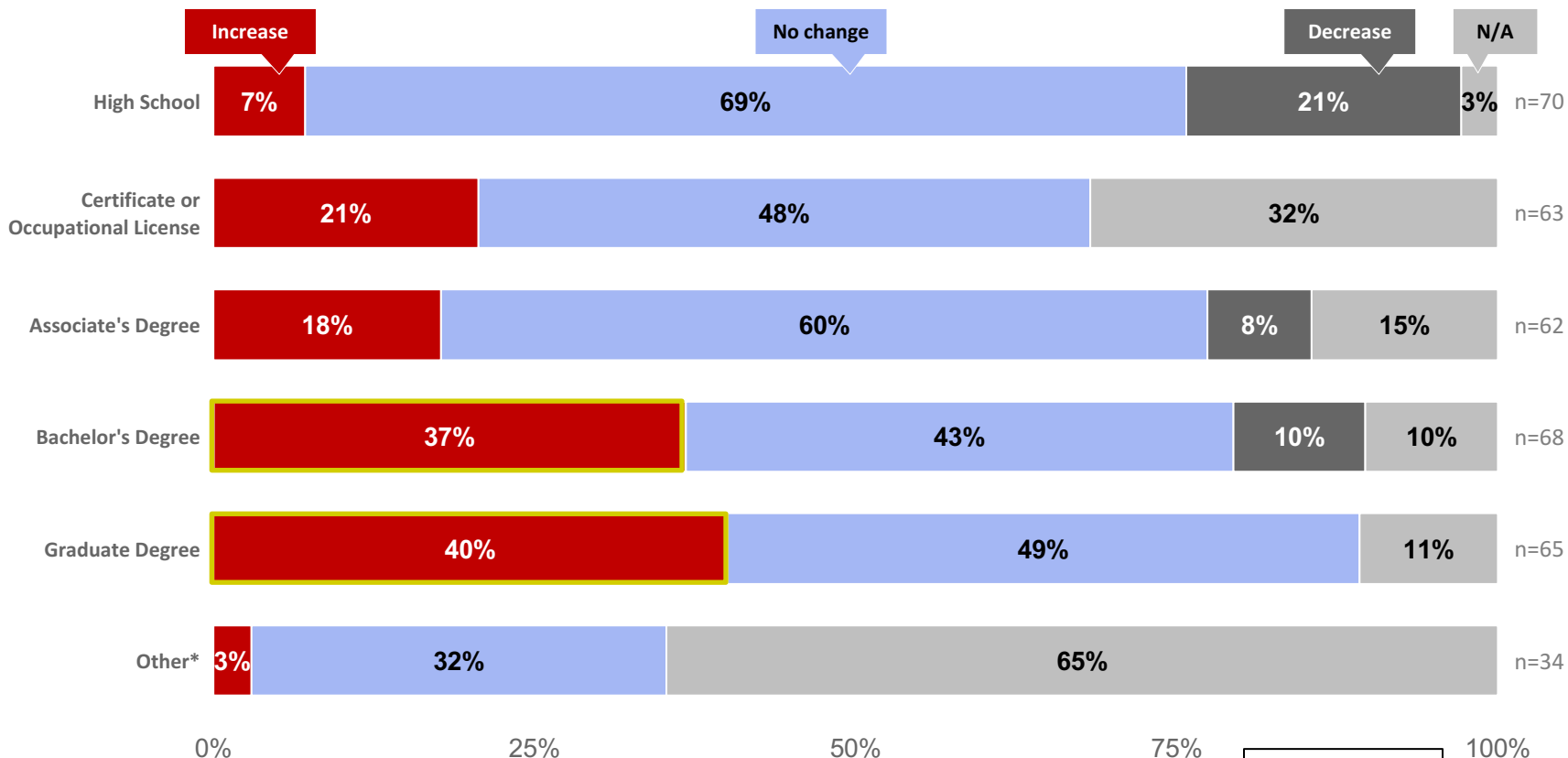*Respondents provided a number of "other" specifications, including craft labor, interns, warehouse workers, and truck drivers.

More than half of respondents' open positions do not require a college degree. However, firms expect educational requirements to increase in the next decade.

Q Please estimate whether you expect the percentage of your company's current job openings that require each minimum education level to increase, decrease, or stay the same over the next 10 years.

Percent of Respondents

	Increase	No change	Decrease	N/A	
High School	7%	69%	21%	3%	n=70
Certificate or Occupational License	21%	48%	32%		n=63
Associate's Degree	18%	60%	8%	15%	n=62
Bachelor's Degree	37%	43%	10%	10%	n=68
Graduate Degree	40%	49%	11%		n=65
Other*	3%	32%	65%		n=34

0%   25%   50%   75%   100%

Source: BRT 2016 Member Company Talent Survey

Responses: n = 34 – 70 depending on education level
*For example, a small group of companies noted that certain positions did not require a minimum education level, or that a minimum education level was "preferred" but not mandatory
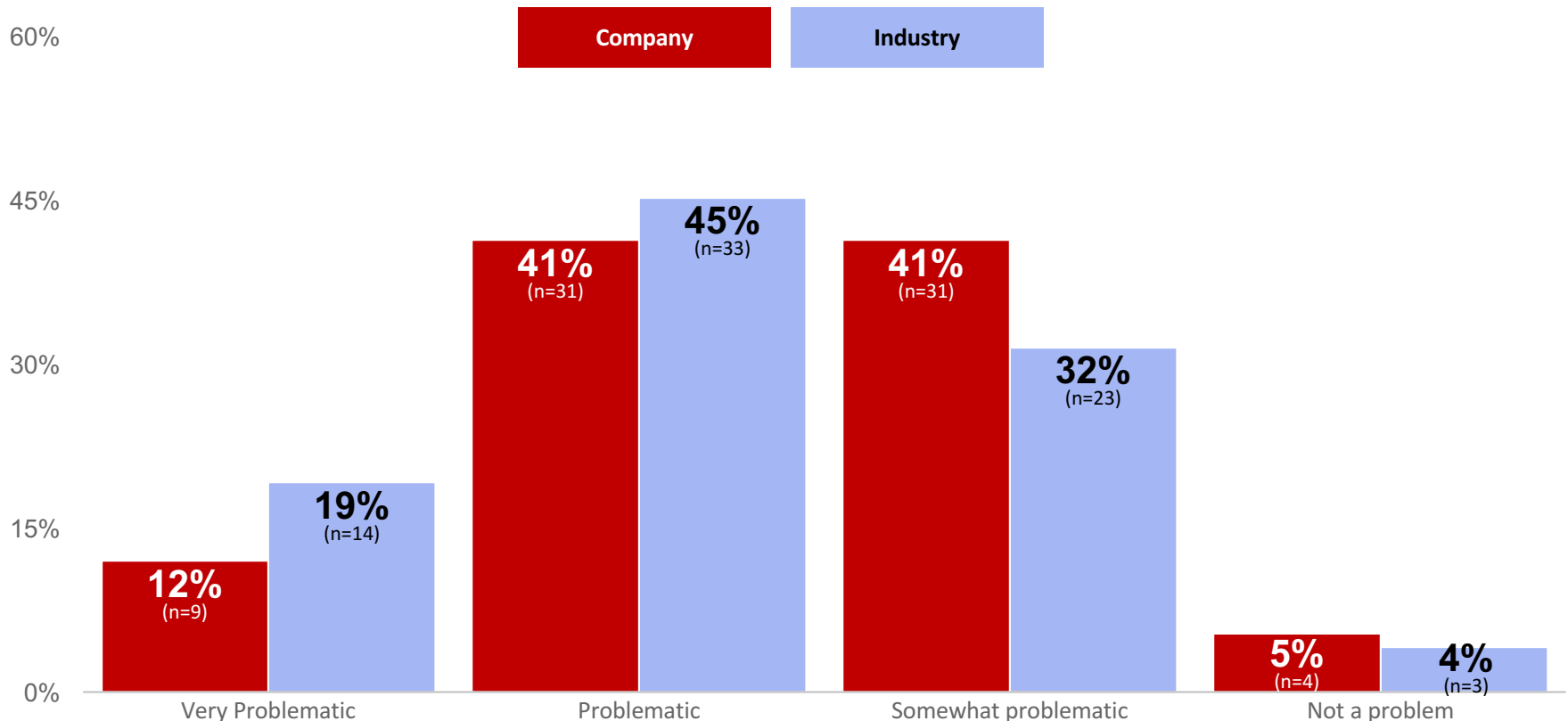
Over half of members believe that skills shortages are problematic or very problematic for both their company and their industry.

Q | To what extent do you consider skills shortages to be a significant problem for your company and for your industry in the United States?

Percent of Respondents

Legend: ■ Company ■ Industry

	Very Problematic	Problematic	Somewhat problematic	Not a problem
Company	12% (n=9)	41% (n=31)	41% (n=31)	5% (n=4)
Industry	19% (n=14)	45% (n=33)	32% (n=23)	4% (n=3)

Responses: n = 75 for company response; n = 73 for industry response

Fundamental math, reading, and writing skills are important, but around half of respondents have difficulty finding qualified applicants who posses these skills.

Q For each **Basic Knowledge** skill and talent attribute, please indicate (1) its relevance to current U.S. job openings in your company; and (2) the extent to which finding qualified applicants who possess the skill is problematic.

Percent of Respondents

| Very | Somewhat | Not |

RELEVANT?

	Very	Somewhat	Not
Reading & writing (fundamental)	82%	11%	7%
Mathematics (fundamental)	75%	21%	4%

PROBLEMATIC?

	Very	Somewhat	Not
Mathematics (fundamental)	12%	47%	41%
Reading & writing (fundamental)	10%	32%	59%

0%   25%   50%   75%   100%

STEM skills are also relevant to respondents, but it is more difficult to find qualified applicants who posses them — especially cybersecurity & data science.
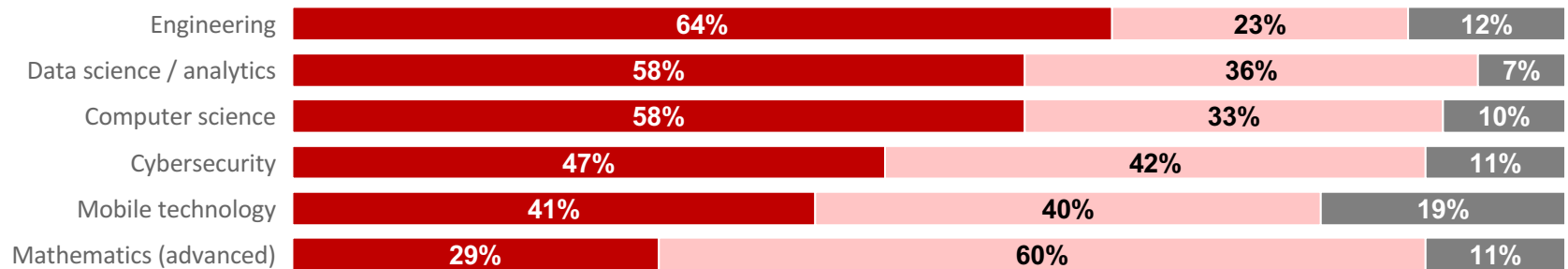
Q For each **Applied Knowledge (STEM)** skill and talent attribute, please indicate (1) its relevance to current U.S. job openings in your company; and (2) the extent to which finding qualified applicants who possess the skill is problematic.

Percent of Respondents

| Very | Somewhat | Not |

RELEVANT?

	Very	Somewhat	Not
Engineering	64%	23%	12%
Data science / analytics	58%	36%	7%
Computer science	58%	33%	10%
Cybersecurity	47%	42%	11%
Mobile technology	41%	40%	19%
Mathematics (advanced)	29%	60%	11%

PROBLEMATIC?

	Very	Somewhat	Not
Cybersecurity	47%	40%	13%
Data science / analytics	44%	45%	11%
Mobile technology	26%	48%	26%
Engineering	23%	59%	18%
Computer science	22%	56%	22%
Mathematics (advanced)	18%	63%	19%
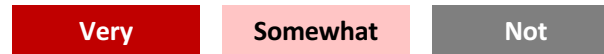
0%   25%   50%   75%   100%

Responses: n = 72 – 73, depending on skill / talent attribute

General applied knowledge skills are highly relevant, but qualified applicants do not always possess them — especially critical thinking & problem solving.

Q For each **Applied Knowledge (General)** skill and talent attribute, please indicate (1) its relevance to current U.S. job openings in your company; and (2) the extent to which finding qualified applicants who possess the skill is problematic.
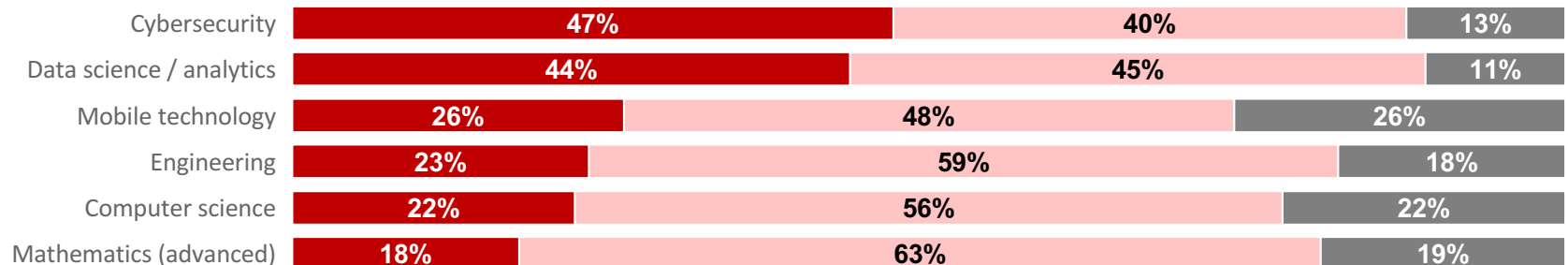
Percent of Respondents

Very	Somewhat	Not

RELEVANT?

Skill	Very	Somewhat	Not
Critical thinking & problem solving	89%	10%	1%
Cognitive flexibility	71%	25%	4%
Innovation & creativity	68%	30%	1%
Design / systems thinking	48%	42%	10%
Cross-disciplinary ability	47%	47%	7%
Global perspective	41%	49%	10%
Research and writing (advanced)	27%	56%	16%

PROBLEMATIC?

Skill	Very	Somewhat	Not
Critical thinking & problem solving	23%	60%	16%
Design / systems thinking	22%	56%	22%
Global perspective	19%	60%	21%
Innovation & creativity	19%	60%	21%
Cognitive flexibility	18%	56%	26%
Cross-disciplinary ability	15%	63%	22%
Research and writing (advanced)	10%	32%	59%

0%   25%   50%   75%   100%

Responses: n = 73

Workplace skills are highly relevant, particularly communication and teamwork.

Q For each **Workplace Skill** / talent attribute, please indicate (1) its relevance to current U.S. job openings in your company; and (2) the extent to which finding qualified applicants who possess the skill is problematic.
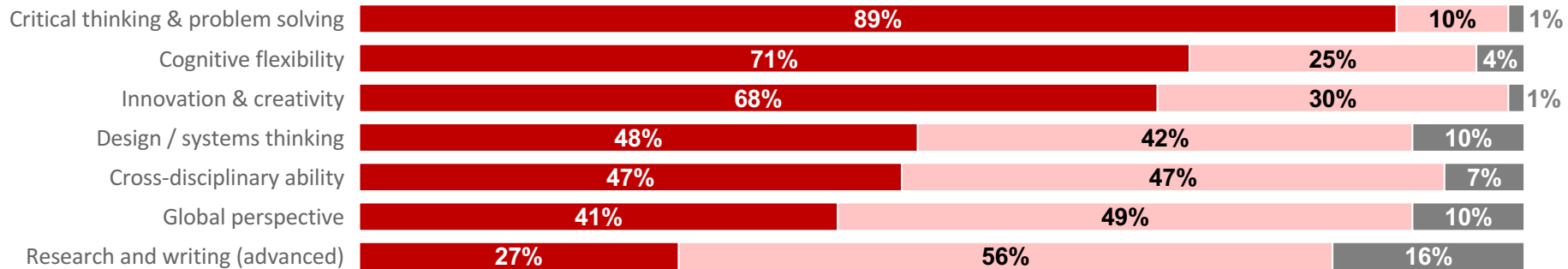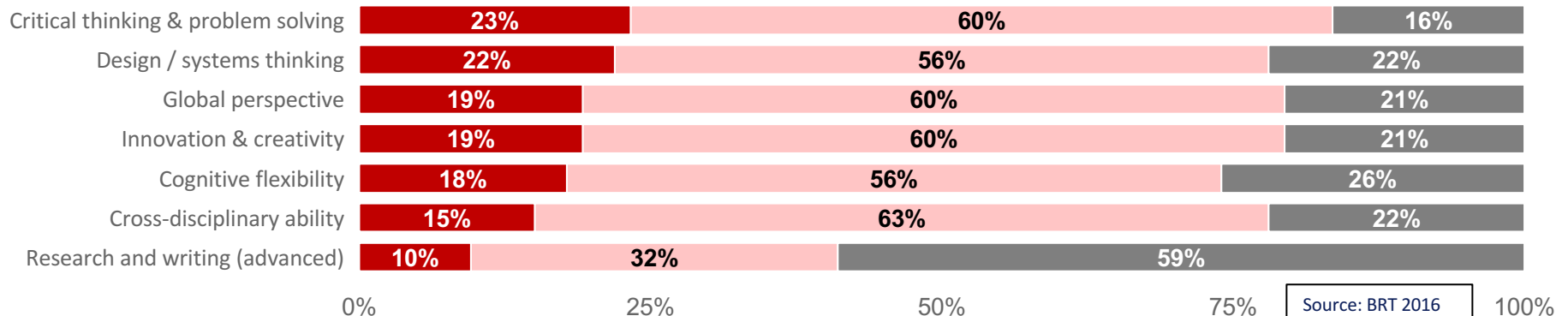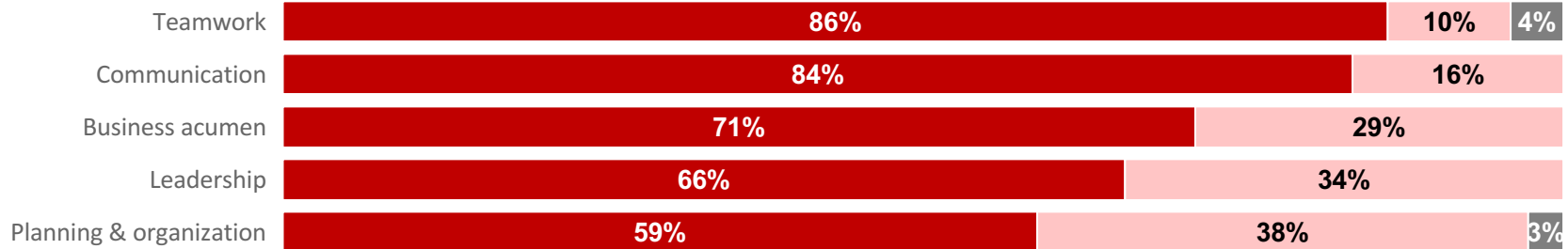
Percent of Respondents

| Very | Somewhat | Not |

RELEVANT?

Skill	Very	Somewhat	Not
Teamwork	86%	10%	4%
Communication	84%	16%	
Business acumen	71%	29%	
Leadership	66%	34%	
Planning & organization	59%	38%	3%

PROBLEMATIC?

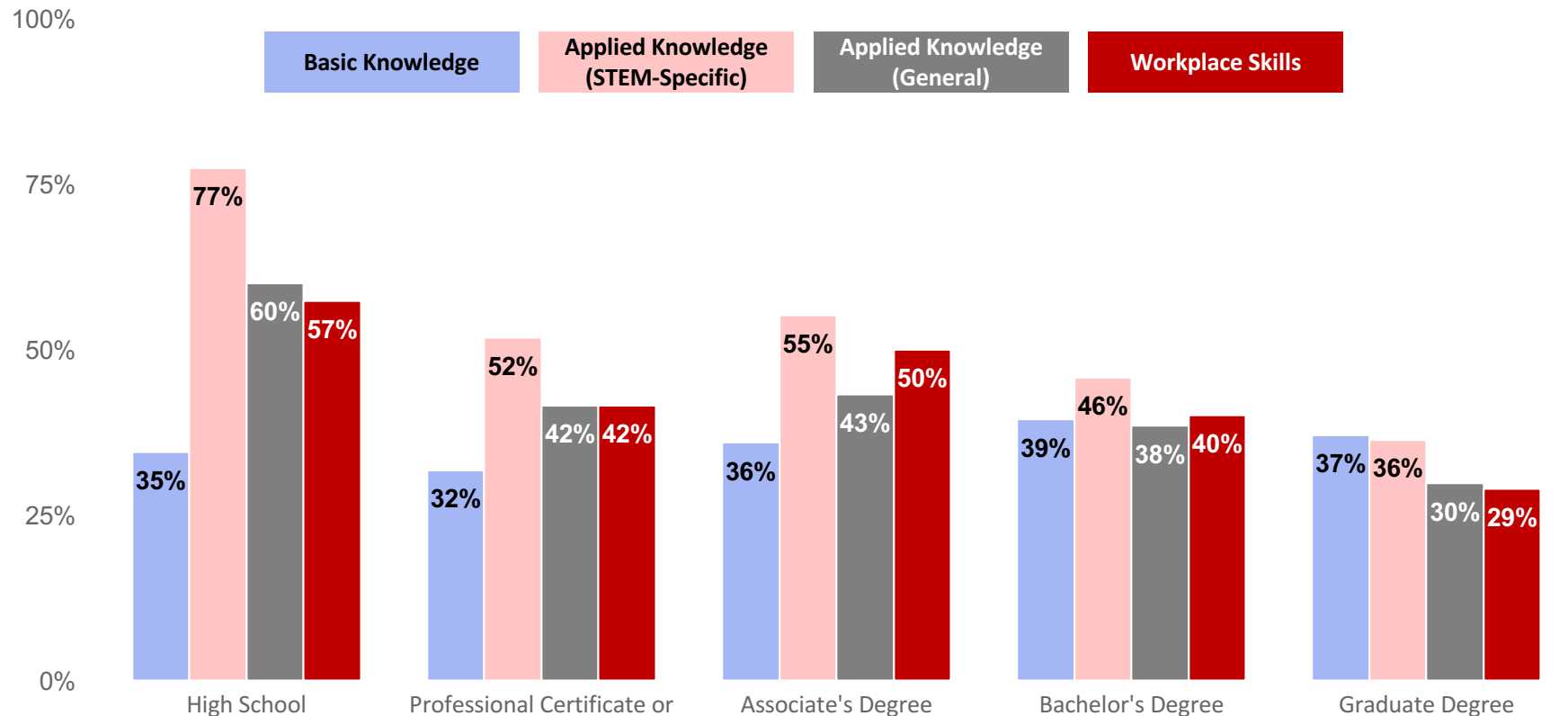| Skill	Very	Somewhat	Not
Leadership	18%	62%	21%
Communication	18%	53%	29%
Business acumen	14%	66%	21%
Teamwork	12%	42%	45%
Planning & organization	10%	58%	33%

0% 25% 50% 75% 100%

Source: BRT 2016 Member Company Talent Survey

Responses: n = 73
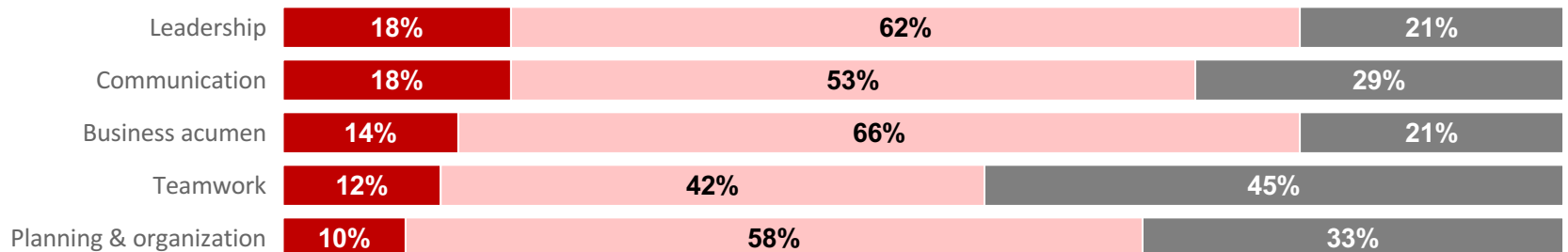
Even among higher-educated job candidates, one-third or more of respondents indicated that significant talent gaps exist across skill types.

Q How significant are skill / talent attribute shortcomings among job candidates? Please specify for each maximum level of **educational attainment** listed.

Percent of Respondents Indicating "Very Significant" or "Significant" Talent Shortcomings among Candidates

Legend:
- Basic Knowledge
- Applied Knowledge (STEM-Specific)
- Applied Knowledge (General)
- Workplace Skills

Education Level	Basic Knowledge	Applied Knowledge (STEM-Specific)	Applied Knowledge (General)	Workplace Skills
High School	35%	77%	60%	57%
Professional Certificate or Occupational License	32%	52%	42%	42%
Associate's Degree	36%	55%	43%	50%
Bachelor's Degree	39%	46%	38%	40%
Graduate Degree	37%	36%	30%	29%

Responses: n = 27 – 62, depending on education level and skill / talent attribute

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Robotics, software, and computer science engineers are among the most difficult positions to fill with qualified candidates.

Q For the following **engineering occupations**, please indicate your agreement with the following statement: I am able to find qualified candidates for open positions.

% of Respondents Indicating "Disagree" or "Strongly Disagree" Regarding Ability to Find Qualified Candidates

Occupation	Percentage
Robotics engineers	57%
Software engineers	43%
Computer scientists / engineers	34%
Architectural engineers	33%
Electronics engineers	29%
Electrical engineers	24%
Materials engineers	19%
Mechanical engineers	15%
Civil engineers	14%
Health and safety engineers	14%
Chemical engineers	13%
Environmental engineers	11%
Management engineers	11%
Construction engineers	10%
Structural engineers	10%
Industrial engineers	8%

0% 25% 50% 75% 100%
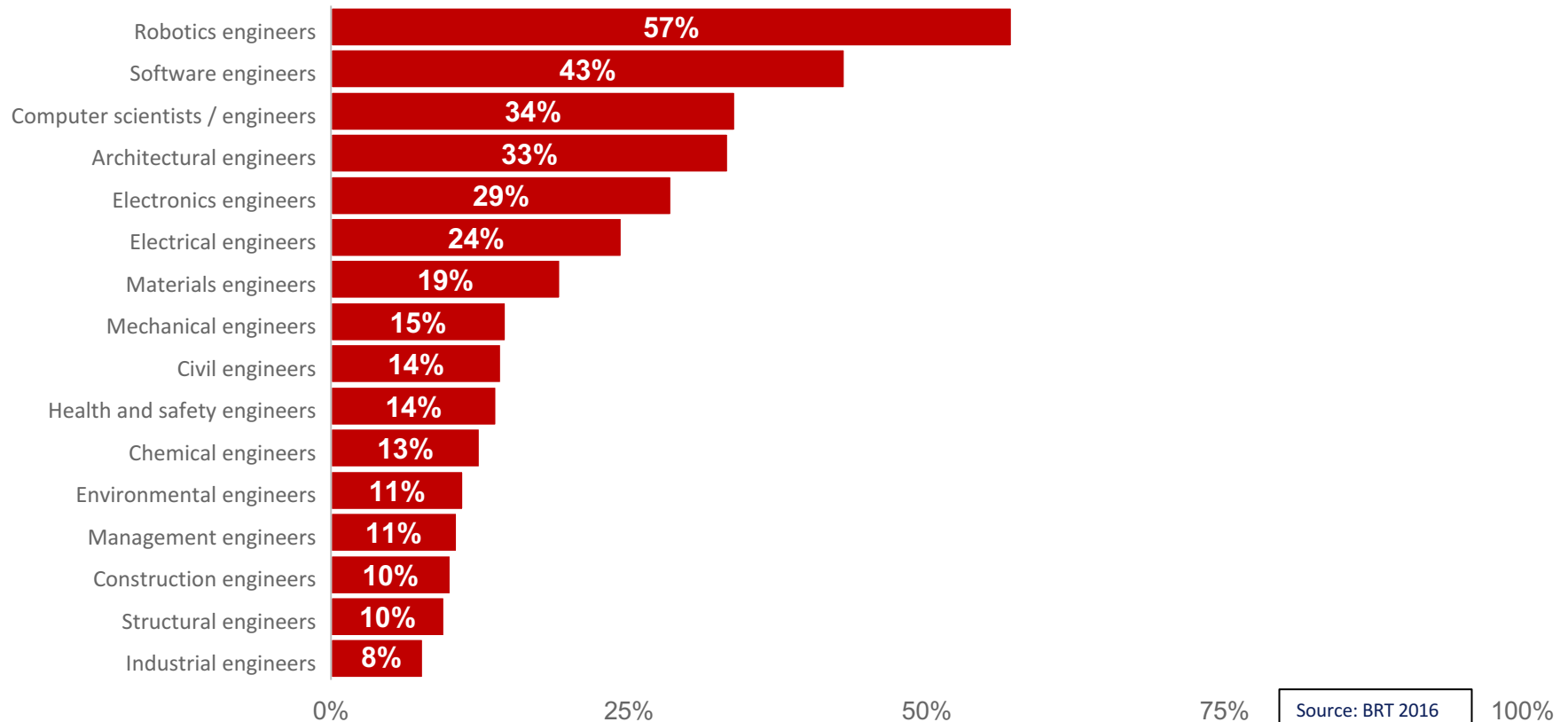
Responses: n = 12 – 56 depending on engineer type
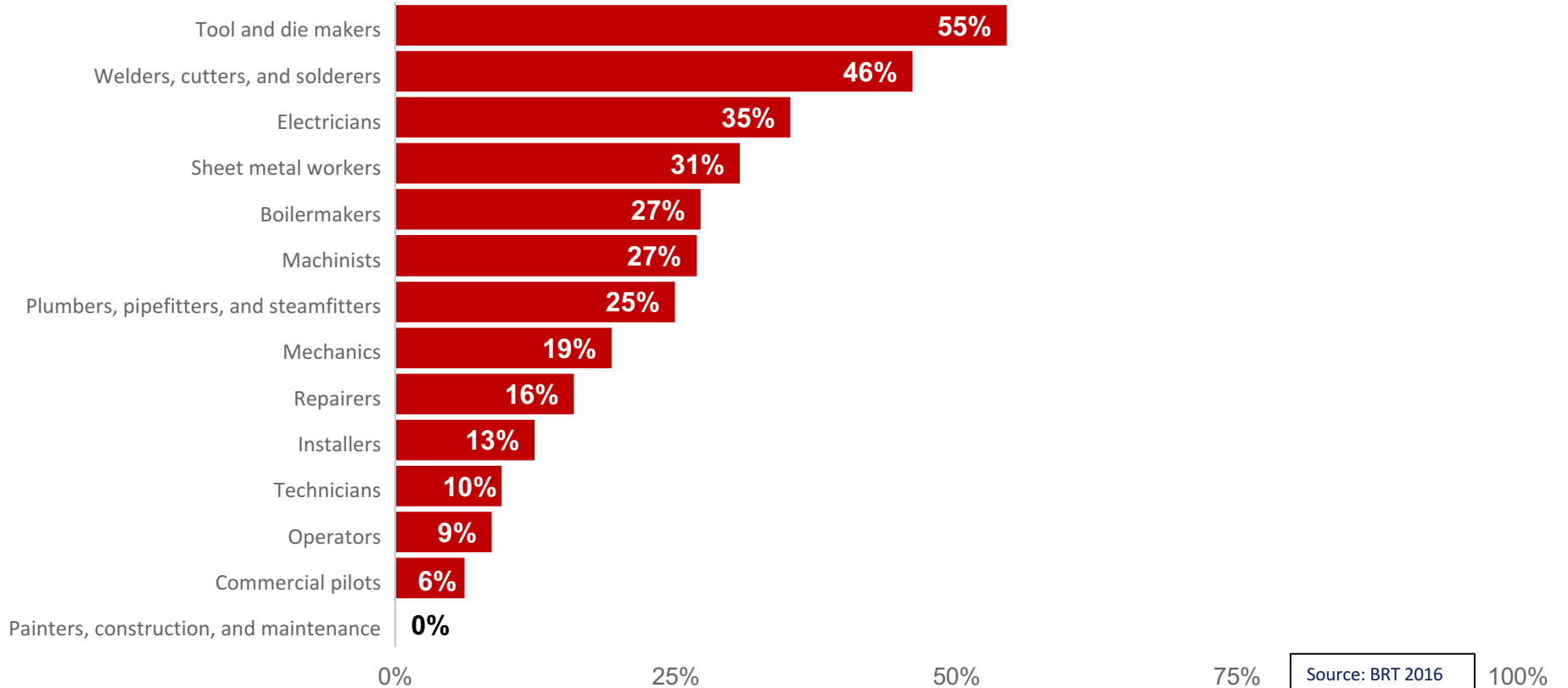Note: this list excludes engineering occupations employed by less than 12 BRT member companies

Source: BRT 2016 Member Company Talent Survey

Among skilled trades, respondents indicated having the greatest difficulty finding qualified tool & die makers, welders/cutters/solderers, and electricians.

Q For the following **skilled trade occupations**, please indicate your agreement with the following statement: I am able to find qualified candidates for open positions.

% of Respondents Indicating "Disagree" or "Strongly Disagree" Regarding Ability to Find Qualified Candidates

Occupation	%
Tool and die makers	55%
Welders, cutters, and solderers	46%
Electricians	35%
Sheet metal workers	31%
Boilermakers	27%
Machinists	27%
Plumbers, pipefitters, and steamfitters	25%
Mechanics	19%
Repairers	16%
Installers	13%
Technicians	10%
Operators	9%
Commercial pilots	6%
Painters, construction, and maintenance	0%

0%   25%   50%   75%   100%

Responses: n = 12 – 34, depending on skilled trade type
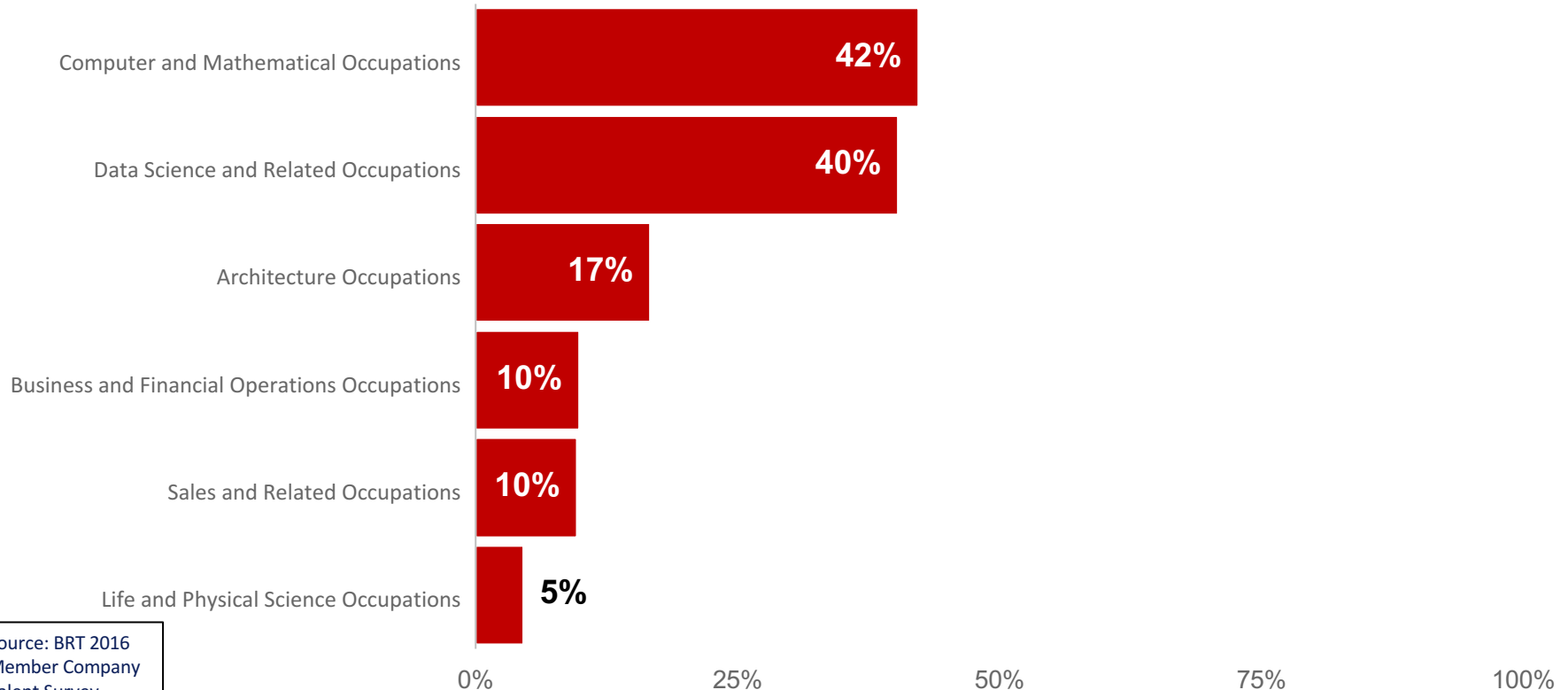Note: this list excludes skilled trade occupations employed by less than 12 BRT member companies

Outside of engineering and skilled trade positions, respondents reported have the most difficulty hiring data science and computer/mathematical workers.

Q For the following **other occupations**, please indicate your agreement with the following statement: I am able to find qualified candidates for open positions.

% of Respondents Indicating "Disagree" or "Strongly Disagree" Regarding Ability to Find Qualified Candidates

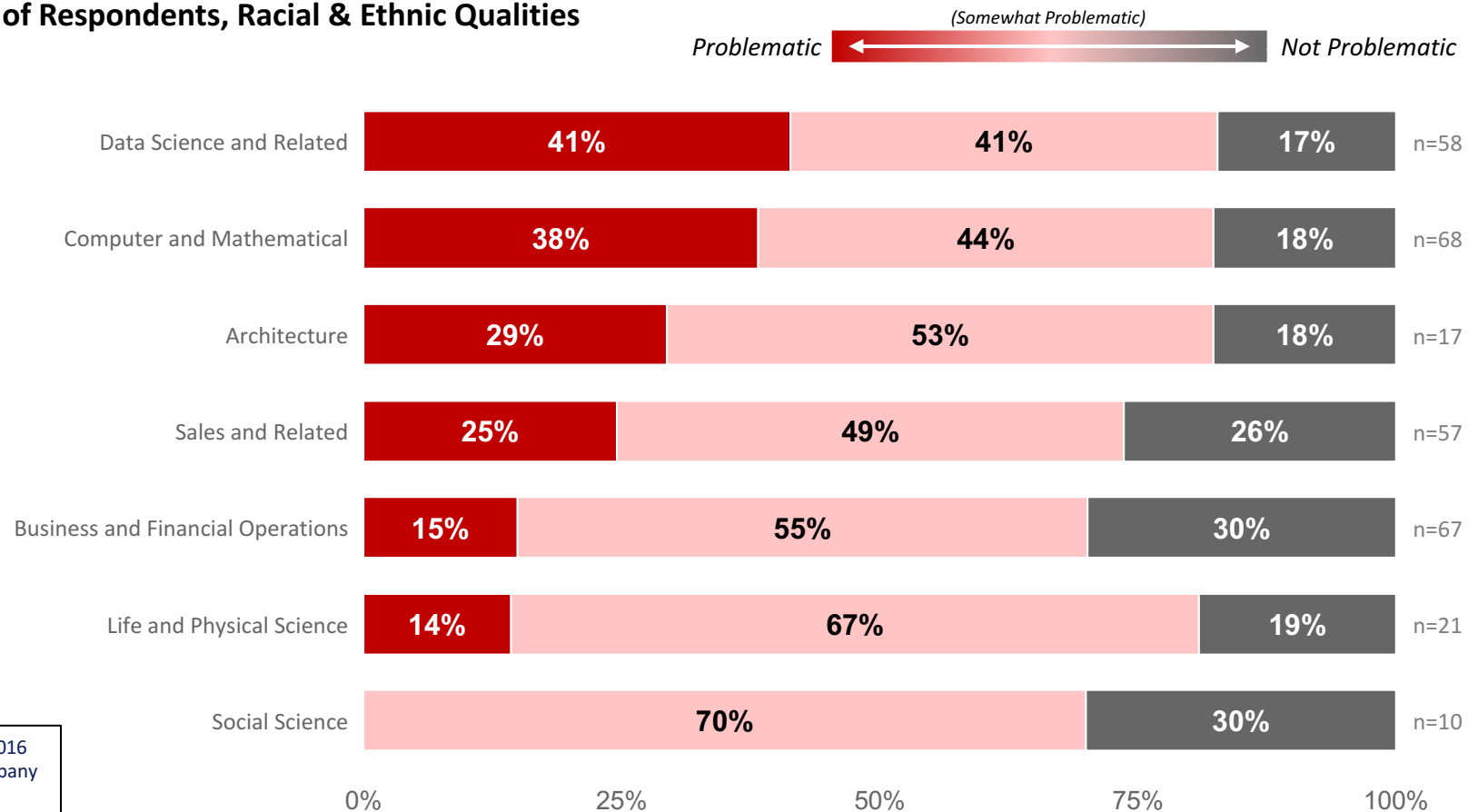| Occupation	Percentage
Computer and Mathematical Occupations	42%
Data Science and Related Occupations	40%
Architecture Occupations	17%
Business and Financial Operations Occupations	10%
Sales and Related Occupations	10%
Life and Physical Science Occupations	5%

0%   25%   50%   75%   100%

Responses: n = 10 – 71, depending on other occupation type
Note: Excludes "Other" category (0 responses)

Hiring racially and ethnically diverse candidates is at least somewhat problematic for most companies, particularly architects and data and computer scientists.

Q For each **other occupation** below, please indicate whether your company struggles to hire qualified candidates with diverse demographic qualities for your U.S. workforce.

Percent of Respondents, Racial & Ethnic Qualities

(Somewhat Problematic)

Problematic ← → *Not Problematic*

Occupation	Problematic	Somewhat Problematic	Not Problematic	n
Data Science and Related	41%	41%	17%	n=58
Computer and Mathematical	38%	44%	18%	n=68
Architecture	29%	53%	18%	n=17
Sales and Related	25%	49%	26%	n=57
Business and Financial Operations	15%	55%	30%	n=67
Life and Physical Science	14%	67%	19%	n=21
Social Science		70%	30%	n=10

0%   25%   50%   75%   100%

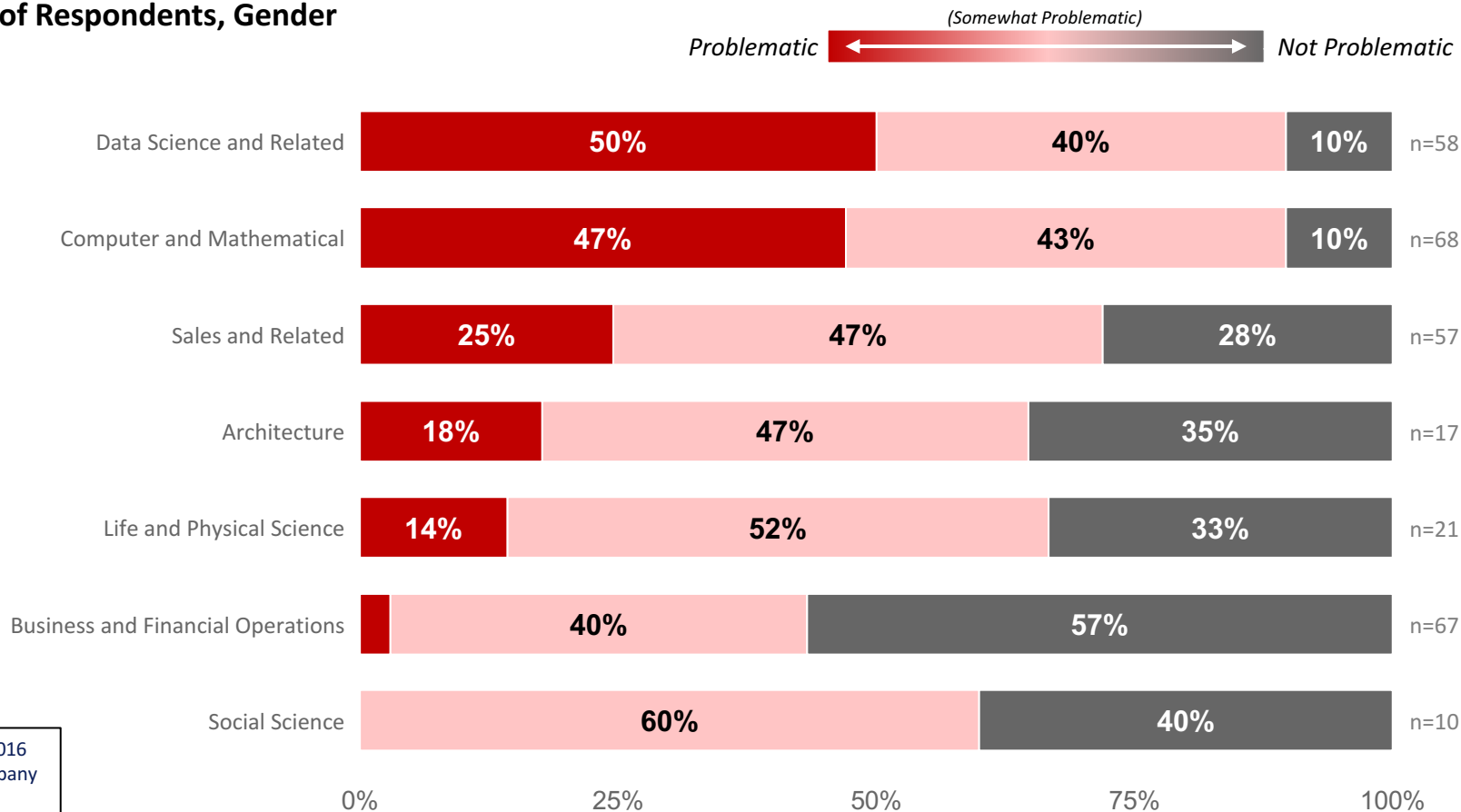Source: BRT 2016 Member Company Talent Survey

Responses: n = 10 – 68, depending on other occupation type

14

Nearly 9 in 10 respondents indicated that ensuring gender diversity in data science and computer/mathematical occupations is at least somewhat problematic.

Q For each **other occupation** below, please indicate whether your company struggles to hire qualified candidates with diverse demographic qualities for your U.S. workforce.

Percent of Respondents, Gender

(Somewhat Problematic)

Problematic ← → *Not Problematic*

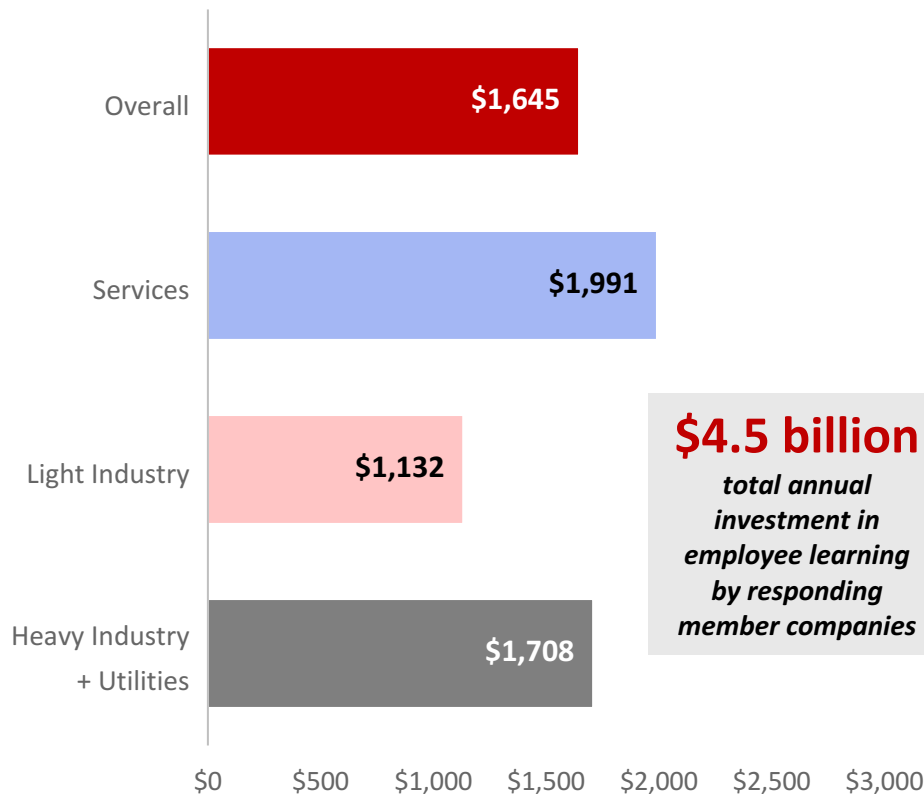| Occupation	Problematic	Somewhat	Not Problematic	n
Data Science and Related	50%	40%	10%	n=58
Computer and Mathematical	47%	43%	10%	n=68
Sales and Related	25%	47%	28%	n=57
Architecture	18%	47%	35%	n=17
Life and Physical Science	14%	52%	33%	n=21
Business and Financial Operations		40%	57%	n=67
Social Science		60%	40%	n=10

0%   25%   50%   75%   100%

Responses: n = 10 – 68, depending on other occupation type

On average, firms invest over $1,600 per employee each year on learning and development programs. Most plan to increase this investment in the next 2 years.
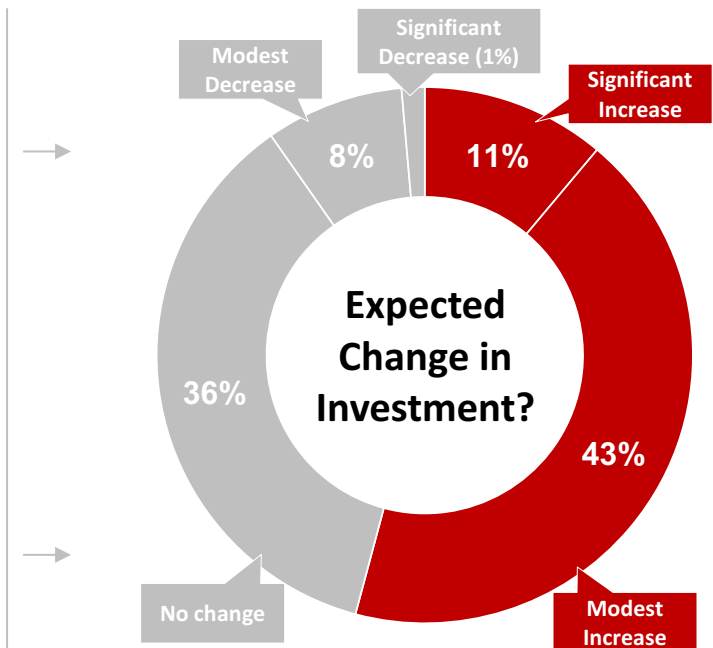
Q Approximately how much does your organization invest annually in employee learning & development activities? How do you expect this to change over the next 24 months?

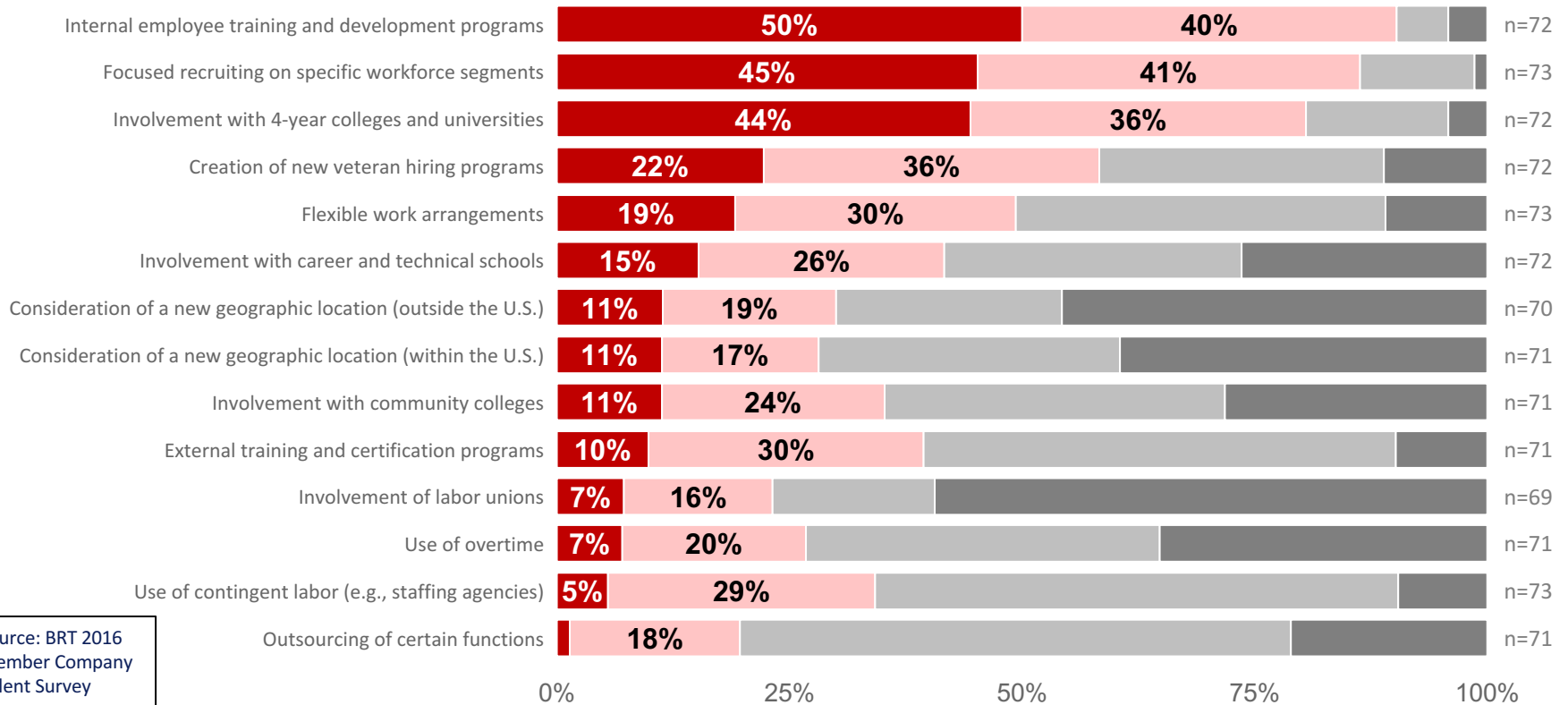## Annual Investment Per Employee in Learning & Development

Category	Amount
Overall	$1,645
Services	$1,991
Light Industry	$1,132
Heavy Industry + Utilities	$1,708

$0 $500 $1,000 $1,500 $2,000 $2,500 $3,000

$4.5 billion
total annual investment in employee learning by responding member companies

Expected Change in Investment

Expected Change in Investment?

- Modest Decrease — 8%
- Significant Decrease (1%)
- Significant Increase — 11%
- No change — 36%
- Modest Increase — 43%

To mitigate skills shortages, respondents conduct internal training, recruit for specific workforce segment, and partner with 4-year colleges and universities.

Q How important are the following techniques to mitigate the effects of existing skills shortages within your workforce?

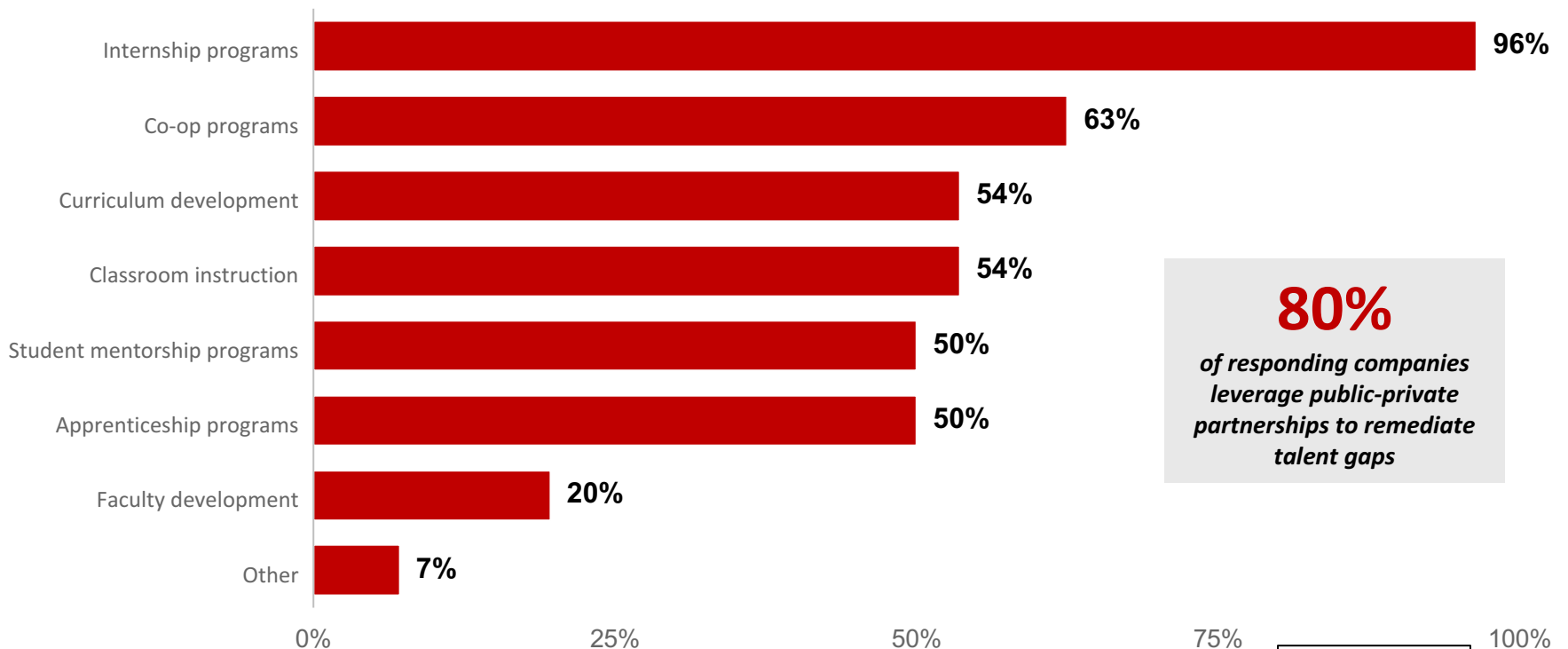**Percent of Respondents**

(Important)   (Somewhat)

Very Important ←————————————→ Not Important

Technique	Very Important	Somewhat	n
Internal employee training and development programs	50%	40%	n=72
Focused recruiting on specific workforce segments	45%	41%	n=73
Involvement with 4-year colleges and universities	44%	36%	n=72
Creation of new veteran hiring programs	22%	36%	n=72
Flexible work arrangements	19%	30%	n=73
Involvement with career and technical schools	15%	26%	n=72
Consideration of a new geographic location (outside the U.S.)	11%	19%	n=70
Consideration of a new geographic location (within the U.S.)	11%	17%	n=71
Involvement with community colleges	11%	24%	n=71
External training and certification programs	10%	30%	n=71
Involvement of labor unions	7%	16%	n=69
Use of overtime	7%	20%	n=71
Use of contingent labor (e.g., staffing agencies)	5%	29%	n=73
Outsourcing of certain functions		18%	n=71

0%   25%   50%   75%   100%

Responses: n = 69 - 73

Most respondents leverage public-private partnerships to remediate talent gaps, predominantly through internship and co-op programs.

Q Is your company currently engaged in any public-private partnerships regarding workforce training or skills development, including partnerships with local universities, community colleges, technical schools, or high schools? What types of programs do these partnerships support?

Percent of Respondents

Program	Percent
Internship programs	96%
Co-op programs	63%
Curriculum development	54%
Classroom instruction	54%
Student mentorship programs	50%
Apprenticeship programs	50%
Faculty development	20%
Other	7%

80%
of responding companies leverage public-private partnerships to remediate talent gaps

Responses: n = 56

BRT members that participate in curriculum development programs are less likely to view their company's skills shortages as problematic or very problematic.

Q *[Cross-Tab: Slides 5 and 18]* To what extent do you consider skills shortages to be a significant problem for your **company** in the United States?

Percent of Respondents (Those Answering Question on Slide 18)

Members that **do** engage in curriculum development
- Not Problematic: 7% (n=2)
- Very Problematic: 16% (n=5)
- Problematic: 27% (n=8)
- Somewhat Problematic: 50% (n=15)

Members that **don't** engage in curriculum development
- Not Problematic: 4% (n=1)
- Very Problematic: 11% (n=3)
- Problematic: 54% (n=14)
- Somewhat Problematic: 31% (n=8)
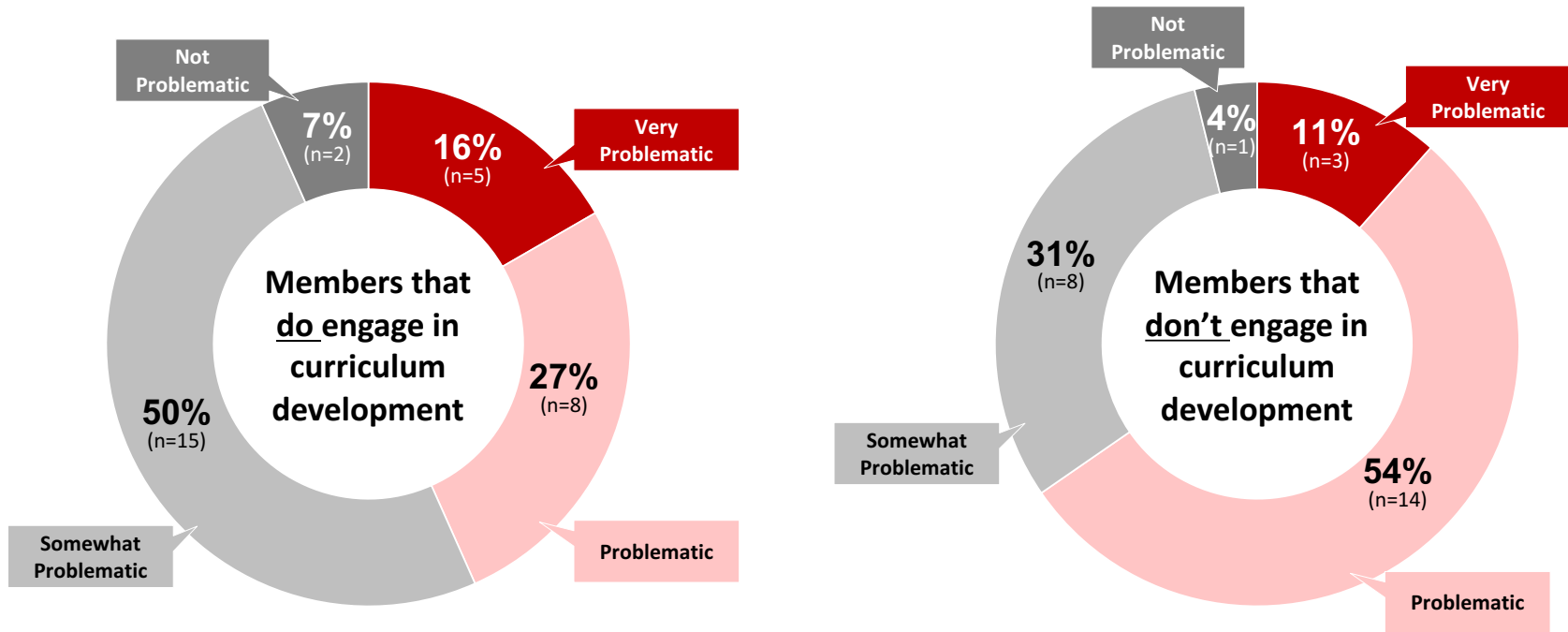
Responses: n = 30 (left), n = 26 (right)

Source: BRT 2016 Member Company Talent Survey

For more information, visit

BusinessRoundtable.org/skills