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Executive Summary

No industry is immune to the skills gap. In every sector and industry, the most experienced and knowledgeable workers are beginning to retire out of the workforce, while business leaders face the challenge of recruiting a new generation that often lacks the skills and training required to fill the positions they leave behind. Nowhere is this crisis more acute than in the manufacturing sector, where the qualified applicant pool is already falling critically short of demand. Given this state, many companies in the industry are beginning to review their internal training programs to ensure that their systems and techniques are up to the challenge.

The purpose of this report is to highlight the current state of workforce training and skills tracking methodologies in the manufacturing sector to better understand the challenges and needs of these companies. This is a vital first step to closing the skills gap.

The data for this report was collected through an anonymous survey sent to business leaders in the manufacturing industry. To ensure accuracy in the findings, we have filtered the results to focus solely on core manufacturing respondents who work in companies that operate at least one production facility. Through this lens, the data covers the full breadth of the manufacturing industry, with insights pulled from companies that operate anywhere from one to more than 10 plants and employ a staff ranging from fewer than 100 workers to more than 500 in a diverse range of industries across discrete and process manufacturing.

Most respondents to this survey (73%) hold management titles in their organizations, ranging from Supervisors (44%) to Vice Presidents/Directors (17%), all the way up to Senior Executives (12%) - meaning these respondents are directly engaged with their companies' training strategies, processes, and outcomes.

Despite the pressure the industry is under in regards to the skills gap, the results shown in this data demonstrate that little is changing in the industrial workforce training. Nearly three-quarters (72%) of the companies rely on traditional shadowing or on-the-floor training methodologies, with only 39% of respondents indicating heavy use of classroom education, and only 10% using outside consultants to supplement their curricula or its delivery. Tracking of the skills and certifications earned by workers in this training is still recorded predominantly either in Excel spreadsheets (54%) or paper records (39%).

The biggest challenges these companies face with training are scheduling (54%), determining effectiveness (44%), and retention of information (42%).

This data suggests a disconnect between the practices and needs of the industry. On one side, respondents indicate that they are relying on traditional, in-house systems that require operational support and cumbersome tracking methods. On the other, the majority of respondents indicate the lack of operational resources to sustain this strategy.

Given the pressure this industry is under to capture, share, and instill technical expertise with a new, digitally focused workforce, it is reasonable to expect that the high numbers in these traditional workforce trainings systems will roll over into more modern solutions.

Travis Hessman, Content Director of *IndustryWeek* and *New Equipment Digest*

Introduction & Methodology

OVERVIEW

Methodology, data collection and analysis by Informa Engage, on behalf of IndustryWeek.

Data collected April 23 through May 8, 2018.

Methodology conforms to accepted marketing research methods, practices and procedures.

PRIMARY OBJECTIVES

- Assess the training standards among respondents.
- Determine challenges with training process.
- Identify the processes and challenges associated with training content creation.

METHODOLOGY

On April 23, 2018, Informa Engage emailed invitations to participate in an online survey to members of the IndustryWeek database.

By May 8, 2018, Informa Engage had received 507 completed surveys. Of those 426 were from companies with at least one plant, whose primary business was not education or consulting. The findings in this report are based on those 426 qualified responses.

RESPONSIVE MOTIVATION

To encourage prompt response and increase the response rate overall, a live link to the survey was included in the email invitation to route respondents directly to the online survey.

The invitations and survey were branded with the IndustryWeek name and logo, in an effort to capitalize on user affinity for this valued brand.

Each respondent was afforded the opportunity to enter a drawing for one of four $100 Visa gift cards.

A follow-up email was sent to non-respondents on April 30, 2018.

Key Findings
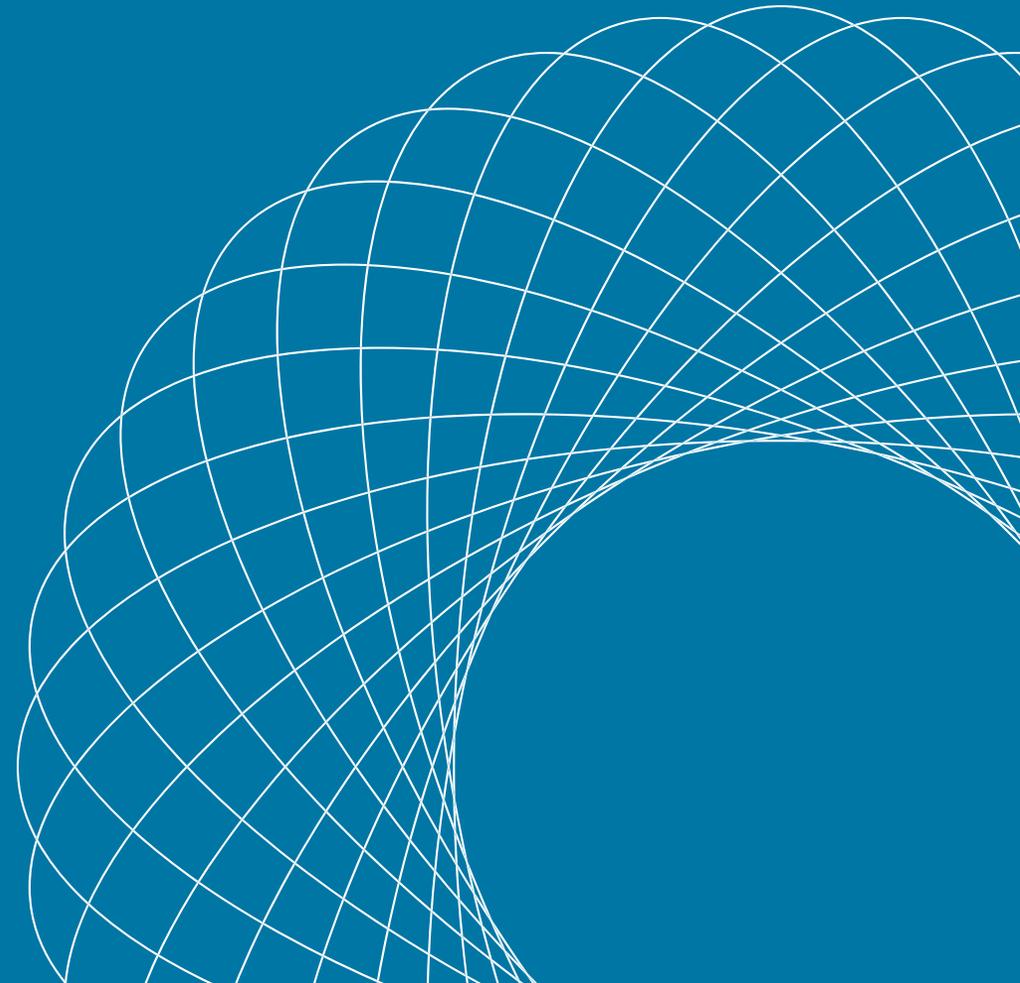
Time Spent Training

New operators receive an average 18 days of training. Established workers receive an average 3.5 hours per month in training.

Average days of training new operators receive (including shadowing)

6%	34%	25%	17%	7%	10%
1 day	2 to 7 days	8 to 14 days	15 to 30 days	31 to 60 days	More than 60 days

Hours per month current factory workers spend in training

12%	41%	30%	9%	8%
0 hours	1 to 2 hours	3 to 5 hours	6 to 10 hours	11+ hours
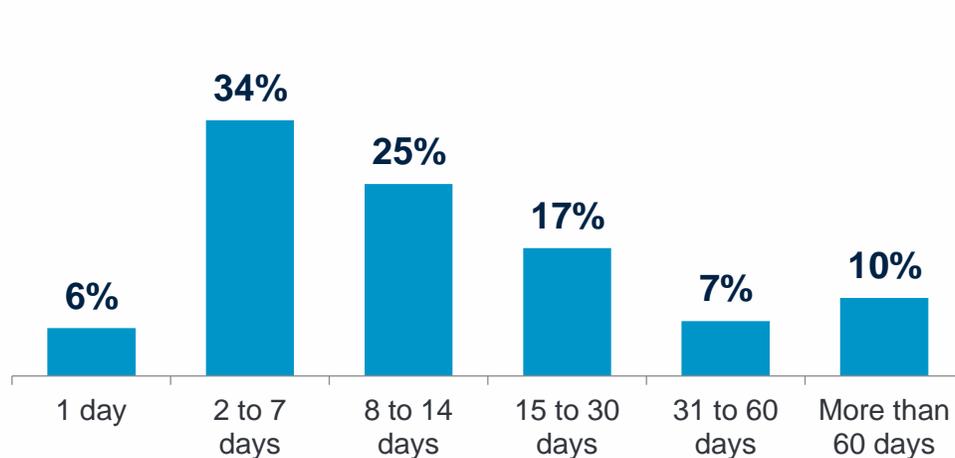
Question: On average, how many days of training do new operators receive (including shadowing)?

Base = All respondents (n=426).

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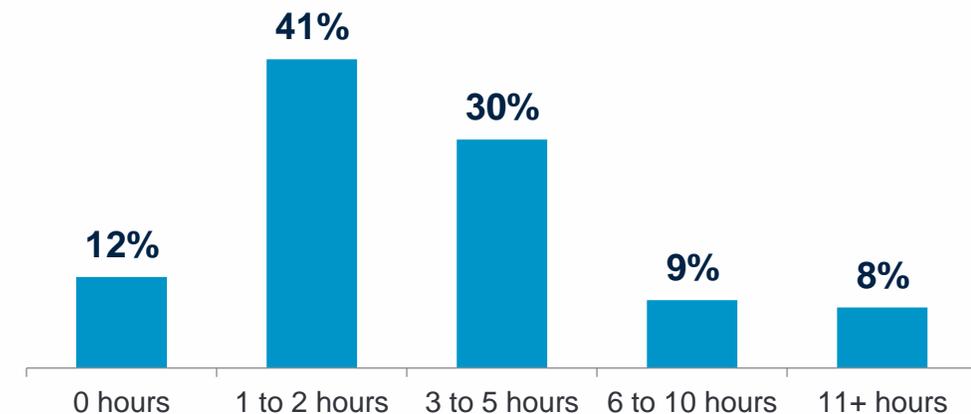
Question: On average, how many hours per month do your current factory workers spend in training?

Base = All respondents (n=424).

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Training Delivery Methods Used & Preferred

Respondents are most likely to use hand-on training delivery methods. Nearly three in four rate their use of on the floor (shadowing) methods as 4 or 5 on a 5-point scale. Seventy-five percent indicate this is most effective. Classroom training is a distant second in terms of use and effectiveness.

Training Delivery Methods Utilized
Rating scale: 1 = "Not at all" and 5 = "To a great extent")

■ 5   ■ 4

Method	5	4
On the floor (shadowing)	43%	29%
Classroom	17%	22%
Online	11%	16%
Consultant	3%	7%
Local college/university	2%	4%
Other (see write-in comments section)	9%	6%

Most Effective Training Delivery Method

Method	
On the floor (pairing)	75%
Classroom	15%
Online	4%
Consultant	2%
Local college/university	1%
Other (see write-in comments section)	3%
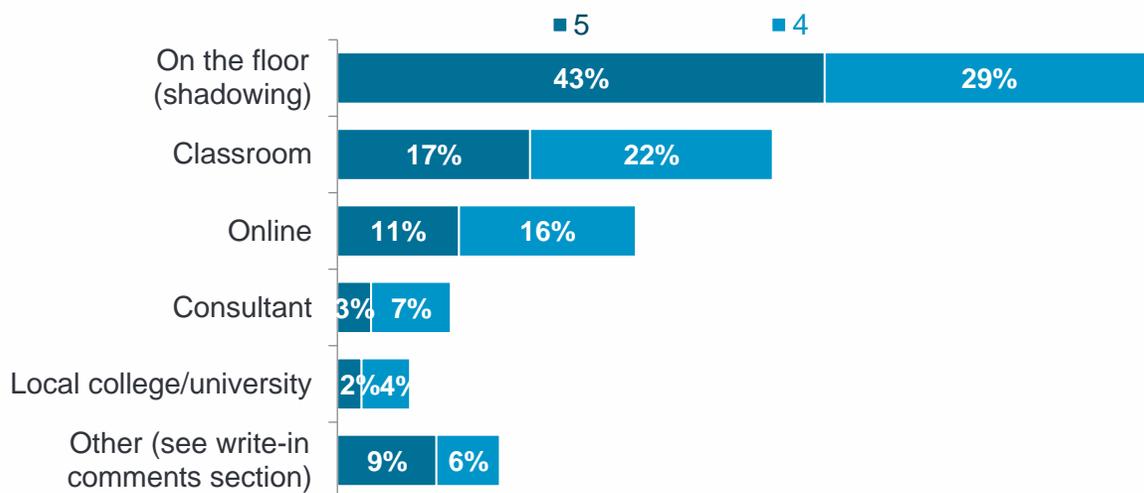
Question: To what extent do you use the following training delivery methods for your operators?

Base = All respondents (n varies from 125 to 412).
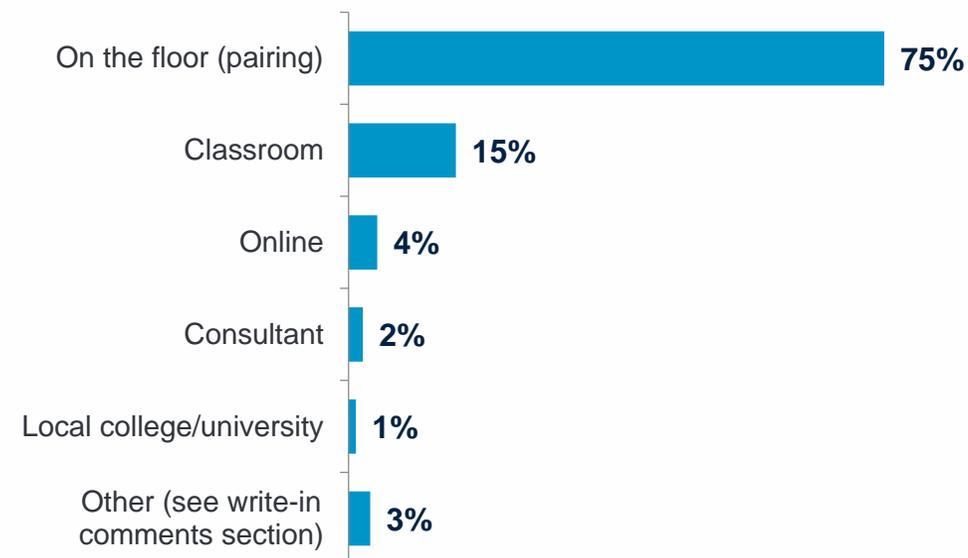
Question: What training method have you found to be most effective?

Base = All respondents (n =426).

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Training Content Mediums Utilized

Training content in written format (paper or digital) and on video are used by a majority of respondents. Relatively few use AR.

62%	56%	54%	7%	13%
Paper written	Video	Digital written	AR	Other (see write-in comments section)
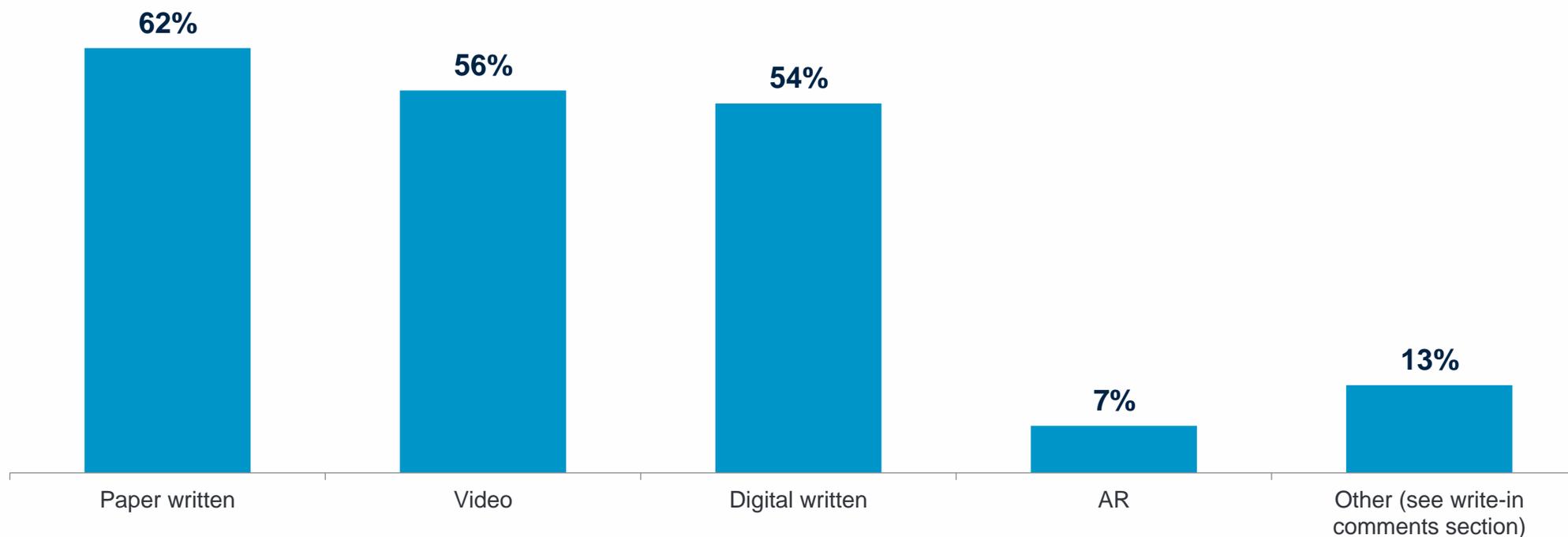
Question: What medium is your training content?
Base = All respondents (n =423). Multiple answers allowed.

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Training Challenges

A majority of respondents indicate scheduling is one of the biggest challenges they face in training factory workers. Determining effectiveness, retention of information, and interrupting operators are also challenges faced by respondents.
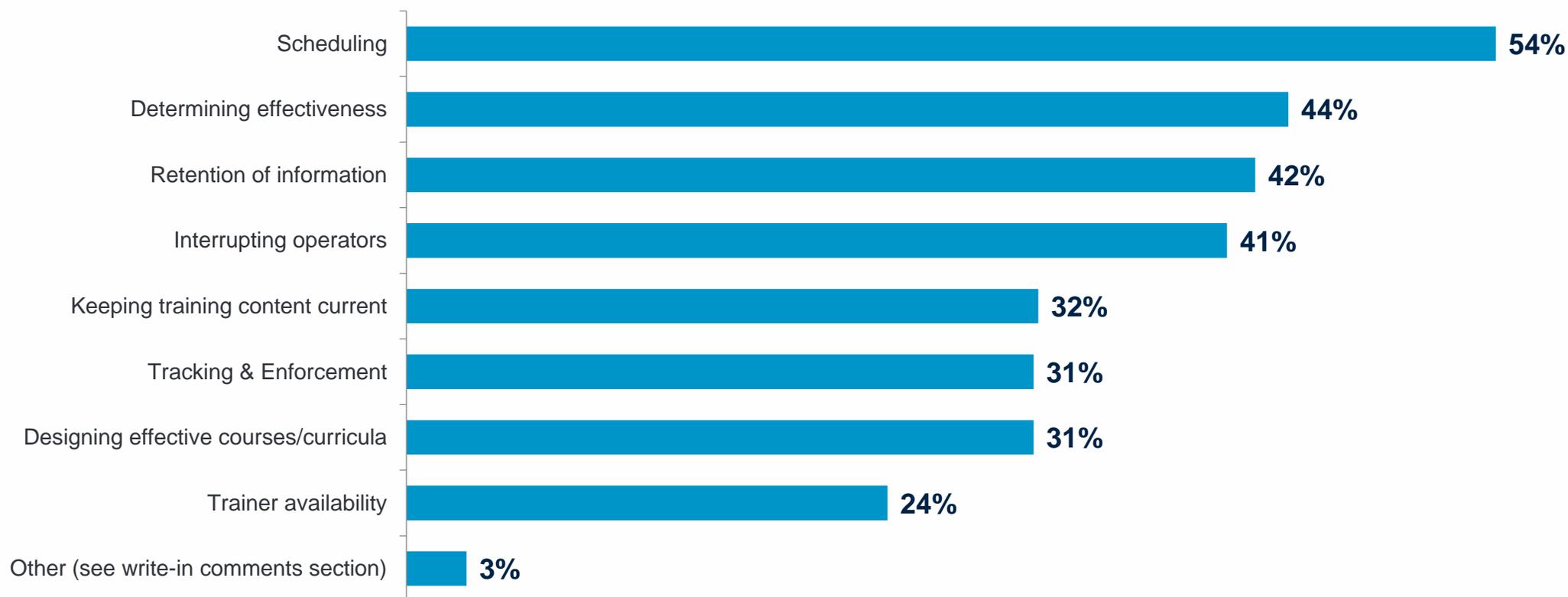
Challenge	Percent
Scheduling	54%
Determining effectiveness	44%
Retention of information	42%
Interrupting operators	41%
Keeping training content current	32%
Tracking & Enforcement	31%
Designing effective courses/curricula	31%
Trainer availability	24%
Other (see write-in comments section)	3%

Question: What are the biggest challenges you face in training your factory workers?

Base = All respondents (n=425). Multiple answers allowed.

Training Challenges by Company Size

The charts below present the same information that was on the previous slide, reported by number of employees. Challenges during the training process varies somewhat by company size.

Fewer than 100 Employees

Challenge	%
Retention of information	41%
Scheduling	41%
Interrupting operators	33%
Determining effectiveness	30%
Keeping training content current	26%
Trainer availability	23%
Designing effective courses/curricula	21%
Tracking & enforcement	20%
Other (see write-in comments section)	5%

100 to 999 Employees

Challenge	%
Scheduling	57%
Interrupting operators	48%
Determining effectiveness	46%
Retention of information	43%
Tracking & enforcement	36%
Keeping training content current	32%
Designing effective courses/curricula	32%
Trainer availability	28%
Other (see write-in comments section)	3%

1,000 or More Employees

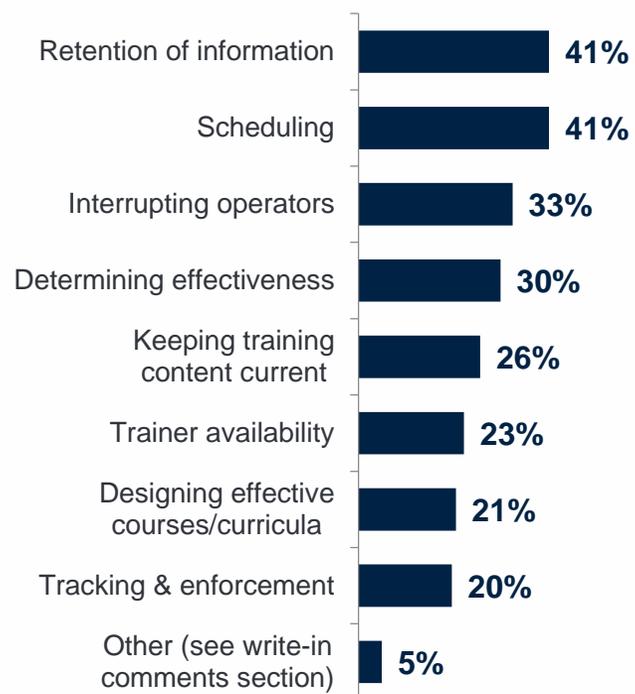| Challenge	%
Scheduling	61%
Determining effectiveness	52%
Retention of information	43%
Interrupting operators	40%
Designing effective courses/curricula	38%
Keeping training content current	35%
Tracking & enforcement	35%
Trainer availability	21%
Other (see write-in comments section)	2%

Question: What are the biggest challenges you face in training your factory workers?
Base = All respondents (n=425). Multiple answers allowed.

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Skill Assessment

Respondents are most likely to assess the skills of operators using supervisor evaluation.
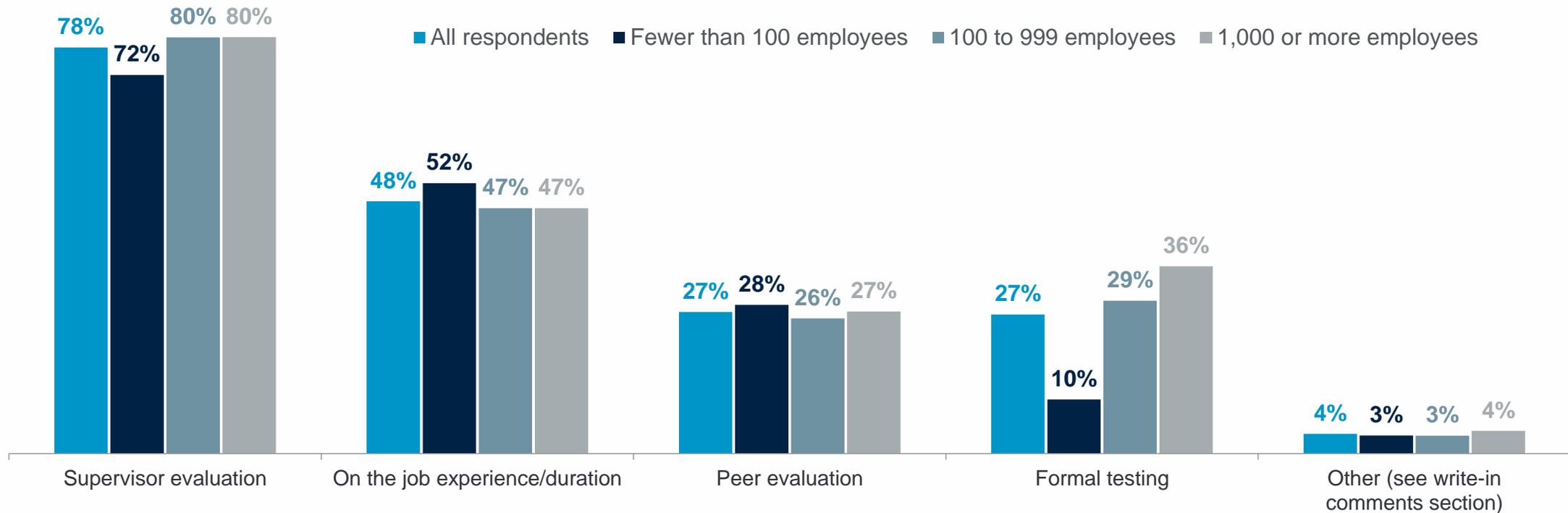
Legend: ■ All respondents ■ Fewer than 100 employees ■ 100 to 999 employees ■ 1,000 or more employees

Supervisor evaluation: 78% | 72% | 80% | 80%

On the job experience/duration: 48% | 52% | 47% | 47%

Peer evaluation: 27% | 28% | 26% | 27%

Formal testing: 27% | 10% | 29% | 36%

Other (see write-in comments section): 4% | 3% | 3% | 4%

Question: How are you currently assessing the skills of your operators? (Select all that apply)

Base = All respondents (n=425). Multiple answers allowed.

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Skill Tracking

Operator skills are most likely tracked in Excel. Companies with fewer than 100 employees are more likely to use paper tracking than electronic tracking.
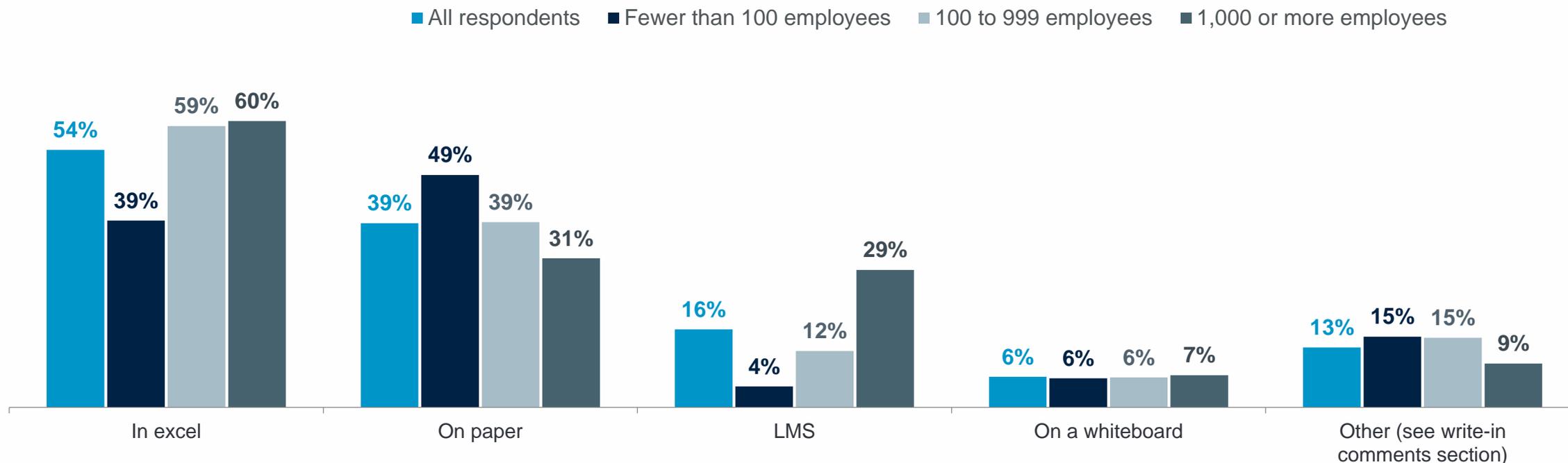
Legend: ■ All respondents ■ Fewer than 100 employees ■ 100 to 999 employees ■ 1,000 or more employees

	All respondents	Fewer than 100 employees	100 to 999 employees	1,000 or more employees
In excel	54%	39%	59%	60%
On paper	39%	49%	39%	31%
LMS	16%	4%	12%	29%
On a whiteboard	6%	6%	6%	7%
Other (see write-in comments section)	13%	15%	15%	9%

Question: How are you currently tracking the skills of your operators? (Select all that apply)

Base = All respondents (n=419). Multiple answers allowed.

Training Effectiveness Measurements

Productivity, quality, and safety improvements are used to measure training program effectiveness.
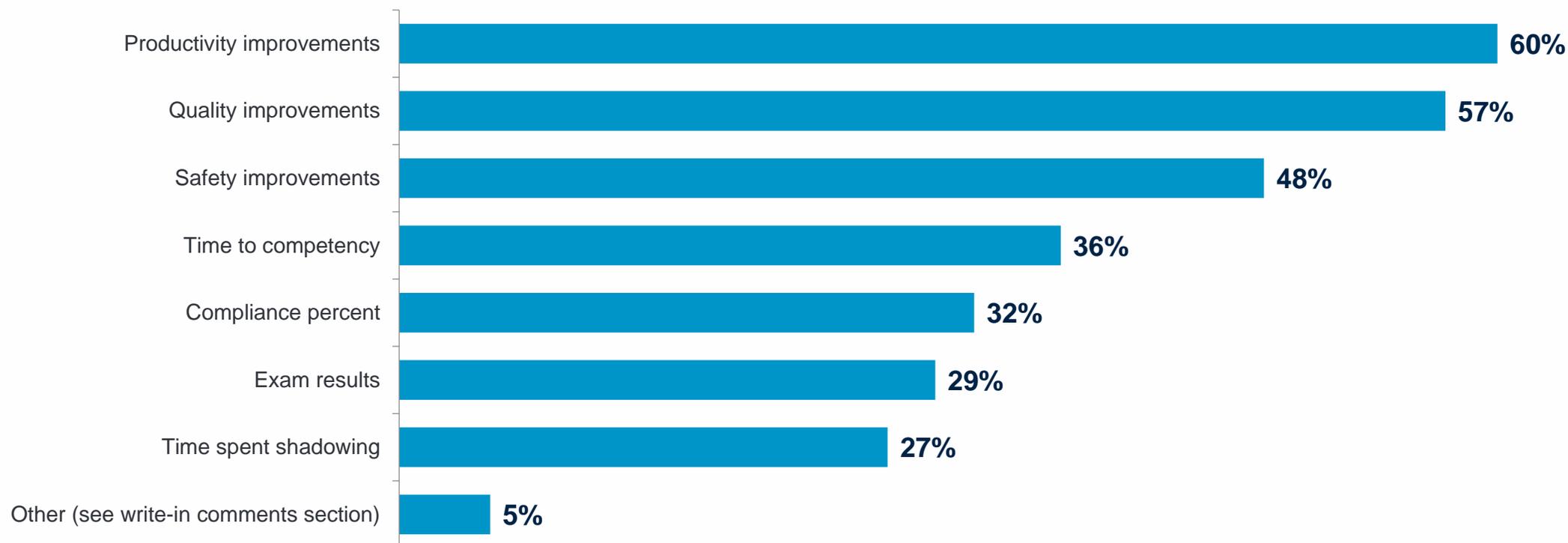
| Measurement	Percentage
Productivity improvements	60%
Quality improvements	57%
Safety improvements	48%
Time to competency	36%
Compliance percent	32%
Exam results	29%
Time spent shadowing	27%
Other (see write-in comments section)	5%

Question: What KPIs do you use to measure the effectiveness of your training program?

Base = All respondents (n=421). Multiple answers allowed.

Training Effectiveness Measurements by Company Size

The top two KPIs used to measure the effectiveness of training programs do not vary by company size.

Fewer than 100 Employees

KPI	Percent
Productivity improvements	63%
Quality improvements	58%
Time to competency	47%
Time spent shadowing	37%
Safety improvements	35%
Compliance percent	24%
Exam results	17%
Other (see write-in comments section)	6%

100 to 999 Employees

KPI	Percent
Productivity improvements	58%
Quality improvements	55%
Safety improvements	50%
Time to competency	36%
Compliance percent	32%
Exam results	32%
Time spent shadowing	22%
Other (see write-in comments section)	7%

1,000 or More Employees

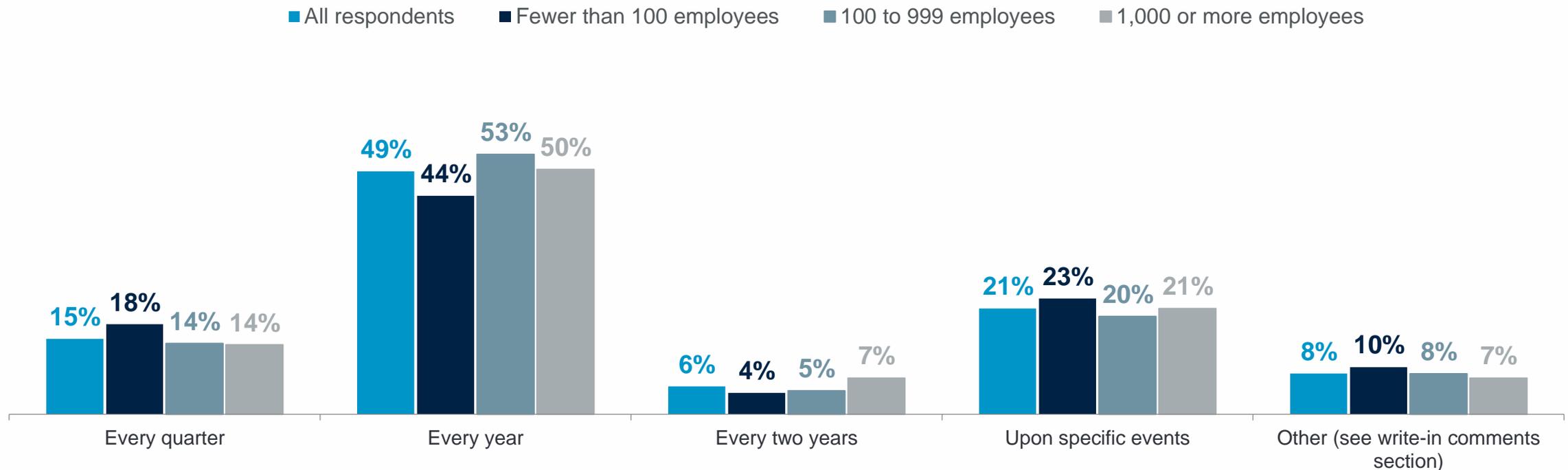| KPI	Percent
Productivity improvements	61%
Quality improvements	59%
Safety improvements	54%
Compliance percent	37%
Exam results	36%
Time to competency	29%
Time spent shadowing	24%
Other (see write-in comments section)	3%

Question: What KPIs do you use to measure the effectiveness of your training program?

Base = All respondents (n=421). Multiple answers allowed.

Re-Evaluation of Skills

Workers' skills are likely to be re-evaluated on an annual basis.

Legend: ■ All respondents ■ Fewer than 100 employees ■ 100 to 999 employees ■ 1,000 or more employees

Category	All respondents	Fewer than 100 employees	100 to 999 employees	1,000 or more employees
Every quarter	15%	18%	14%	14%
Every year	49%	44%	53%	50%
Every two years	6%	4%	5%	7%
Upon specific events	21%	23%	20%	21%
Other (see write-in comments section)	8%	10%	8%	7%

Question: How often do you re-evaluate your workers' skills?
Base = All respondents (n=424).

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Training Content Creation

It is unlikely for more than 5 hours to be set aside in an average week to create training content.

Legend:
■ All respondents ■ Fewer than 100 employees ■ 100 to 999 employees ■ 1,000 or more employees

5 hours or less: 42% / 45% / 46% / 38%
6 to 20 hours: 16% / 12% / 19% / 17%
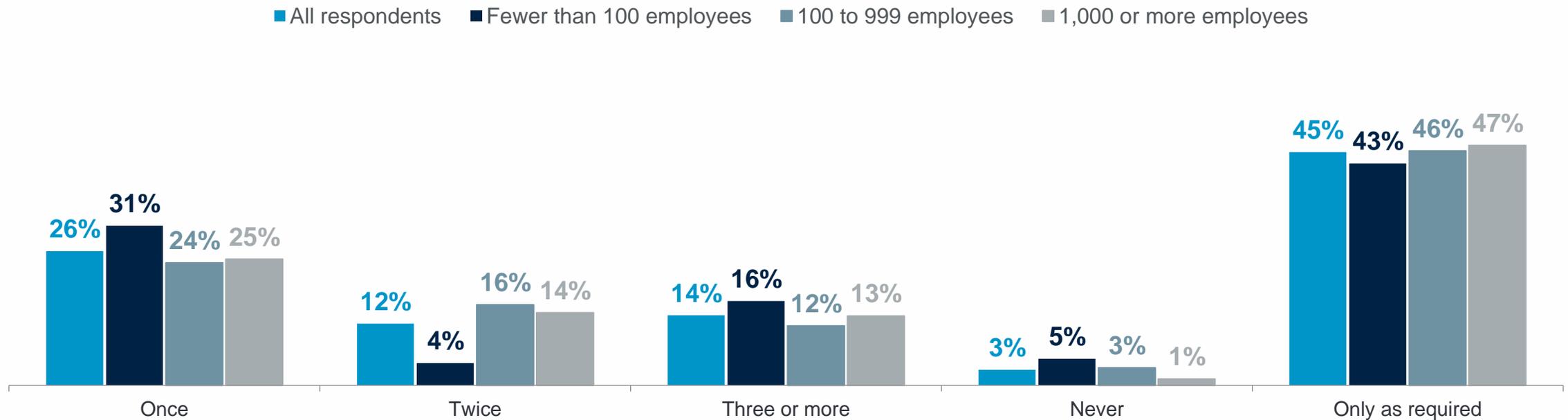**More than 20 hours:** 5% / 1% / 3% / 9%
As needed: 36% / 42% / 32% / 36%
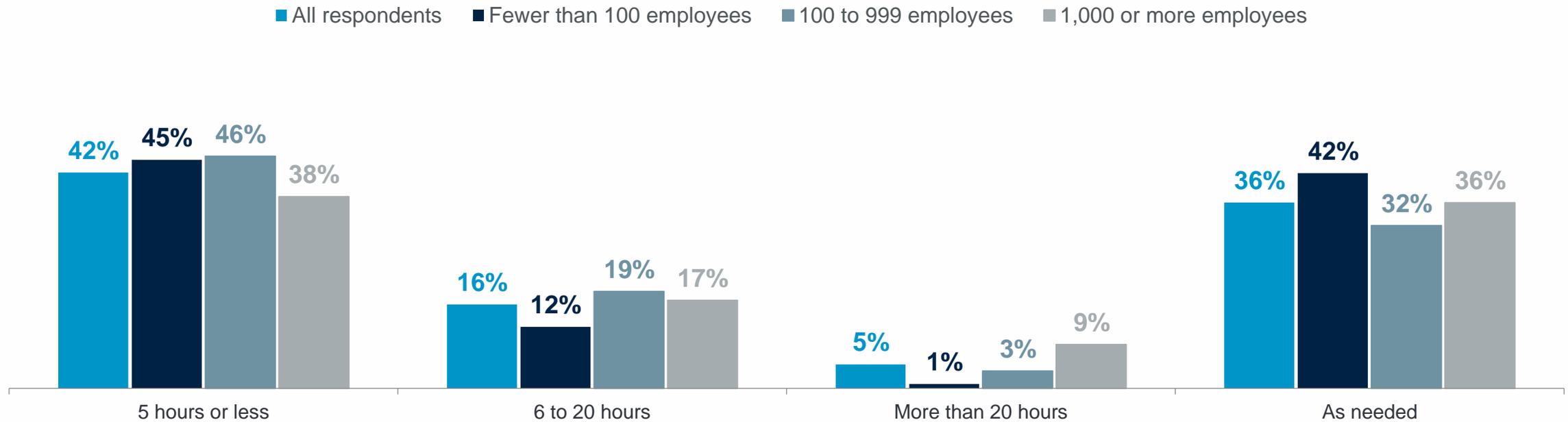
Question: Per plant, what is the average number of employee hours spent creating training content per week?
Base = All respondents (n=425).

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Training Content Update and Review

Training content is likely reviewed and updated on an as-needed basis.

Legend: All respondents | Fewer than 100 employees | 100 to 999 employees | 1,000 or more employees

Once
- 26%
- 31%
- 24%
- 25%

Twice
- 12%
- 4%
- 16%
- 14%

Three or more
- 14%
- 16%
- 12%
- 13%

Never
- 3%
- 5%
- 3%
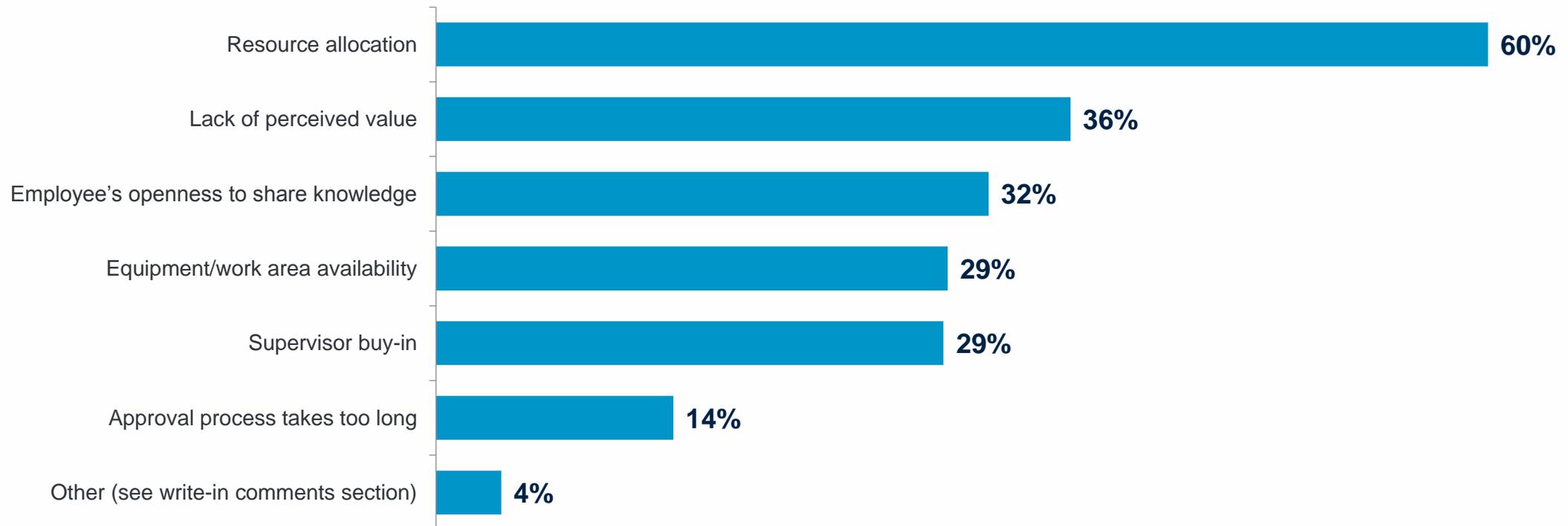- 1%

Only as required
- 45%
- 43%
- 46%
- 47%

Question: How many times per year do you update or review your training content?
Base = All respondents (n=426).

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Content Creation Challenges

Resource allocation is the biggest challenge related to training content creation.

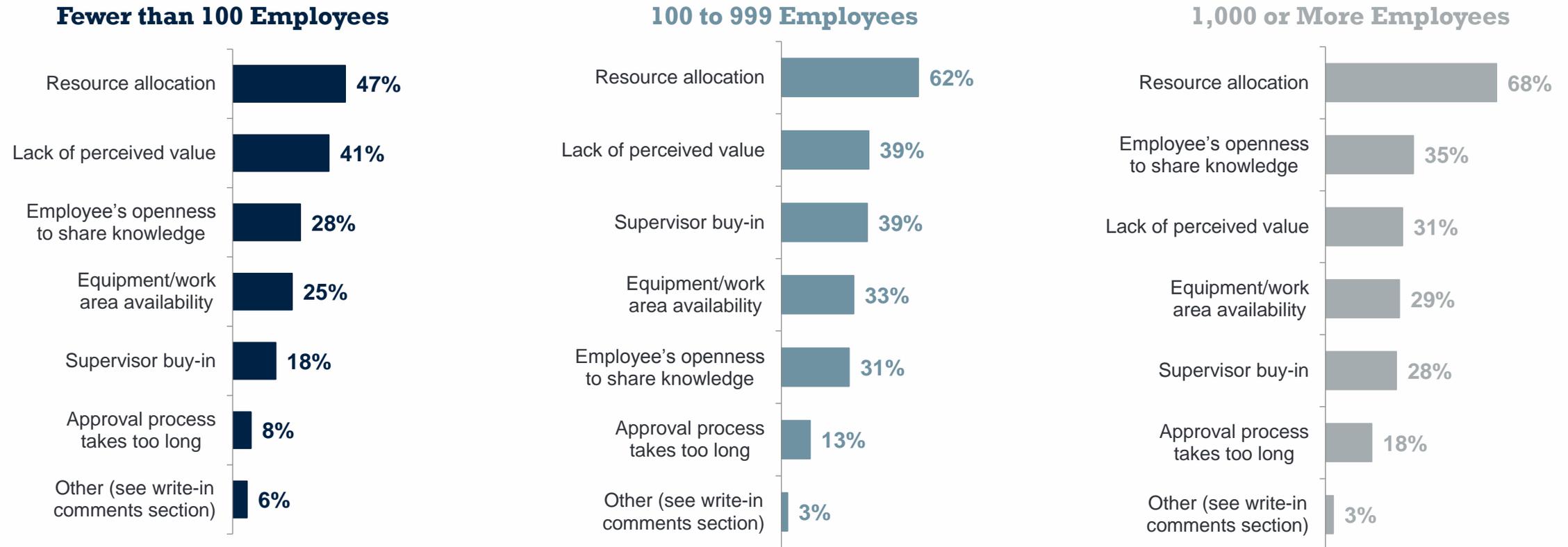| Challenge	Percentage
Resource allocation	60%
Lack of perceived value	36%
Employee's openness to share knowledge	32%
Equipment/work area availability	29%
Supervisor buy-in	29%
Approval process takes too long	14%
Other (see write-in comments section)	4%

Question: What are your biggest challenges related to training content creation? (Select all that apply)

Base = All respondents (n=426). Multiple answers allowed.

Content Creation Challenges by Company Size

Larger companies are more likely than smaller companies to consider resource allocation a big challenge related to training content creation.
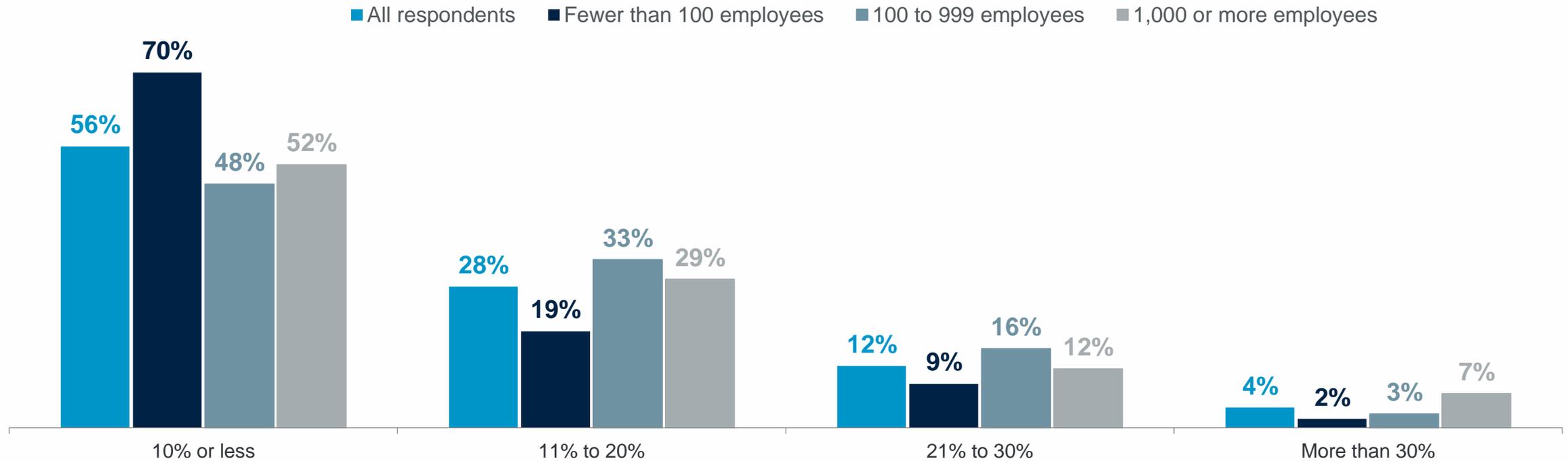
Fewer than 100 Employees

Challenge	%
Resource allocation	47%
Lack of perceived value	41%
Employee's openness to share knowledge	28%
Equipment/work area availability	25%
Supervisor buy-in	18%
Approval process takes too long	8%
Other (see write-in comments section)	6%

100 to 999 Employees

Challenge	%
Resource allocation	62%
Lack of perceived value	39%
Supervisor buy-in	39%
Equipment/work area availability	33%
Employee's openness to share knowledge	31%
Approval process takes too long	13%
Other (see write-in comments section)	3%

1,000 or More Employees

Challenge	%
Resource allocation	68%
Employee's openness to share knowledge	35%
Lack of perceived value	31%
Equipment/work area availability	29%
Supervisor buy-in	28%
Approval process takes too long	18%
Other (see write-in comments section)	3%

Question: What are your biggest challenges related to training content creation? (Select all that apply)

Base = All respondents (n=426). Multiple answers allowed.

Annual Turnover

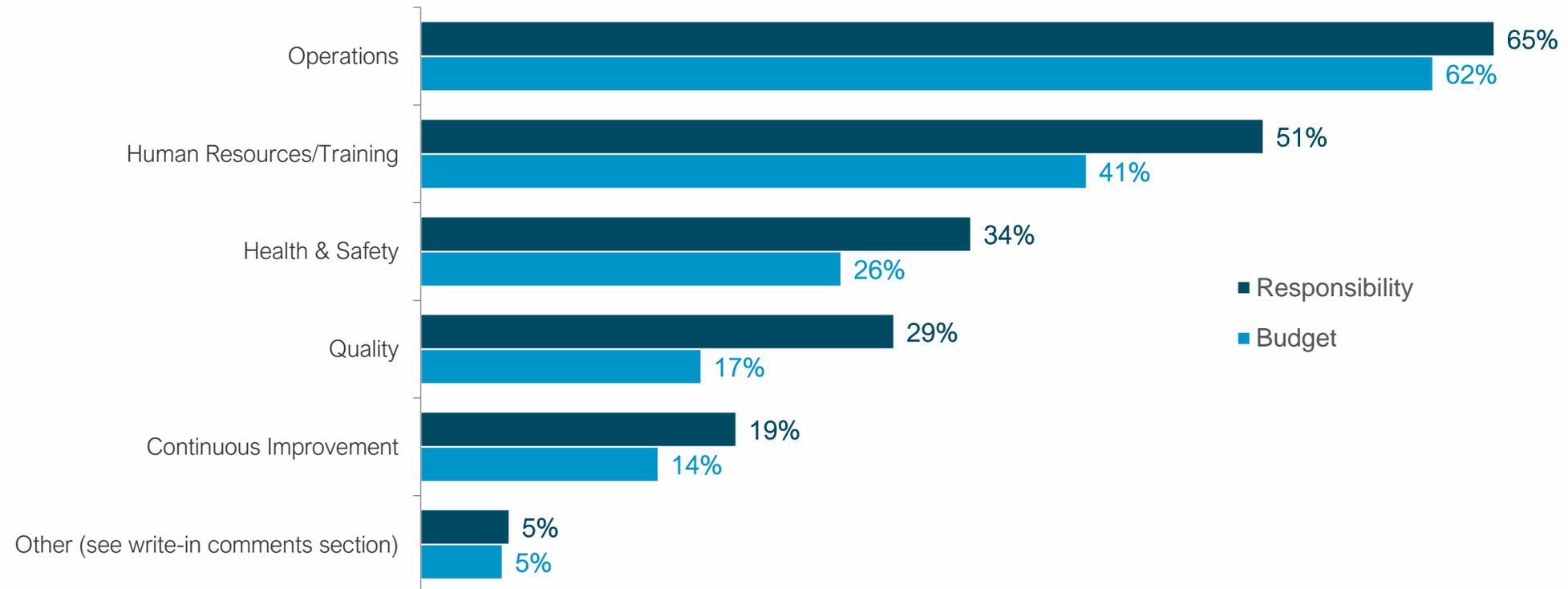The majority of respondents have an annual operator turnover of 10% or less.

■ All respondents ■ Fewer than 100 employees ■ 100 to 999 employees ■ 1,000 or more employees

	10% or less	11% to 20%	21% to 30%	More than 30%
All respondents	56%	28%	12%	4%
Fewer than 100 employees	70%	19%	9%	2%
100 to 999 employees	48%	33%	16%	3%
1,000 or more employees	52%	29%	12%	7%

Question: What is your average annual turnover on operators?

Base = All respondents (n=425).

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Training Responsibility and Budget

Training responsibility and budgeting typically falls under operations. HR is also likely to take responsibility for training, but less likely to have training costs come from their budget.

Operations
- Responsibility: 65%
- Budget: 62%

Human Resources/Training
- Responsibility: 51%
- Budget: 41%

Health & Safety
- Responsibility: 34%
- Budget: 26%

Quality
- Responsibility: 29%
- Budget: 17%

Continuous Improvement
- Responsibility: 19%
- Budget: 14%

Other (see write-in comments section)
- Responsibility: 5%
- Budget: 5%

Legend:
- ■ Responsibility
- ■ Budget

Question: Which department owns the responsibility for training operators? (Select all that apply)

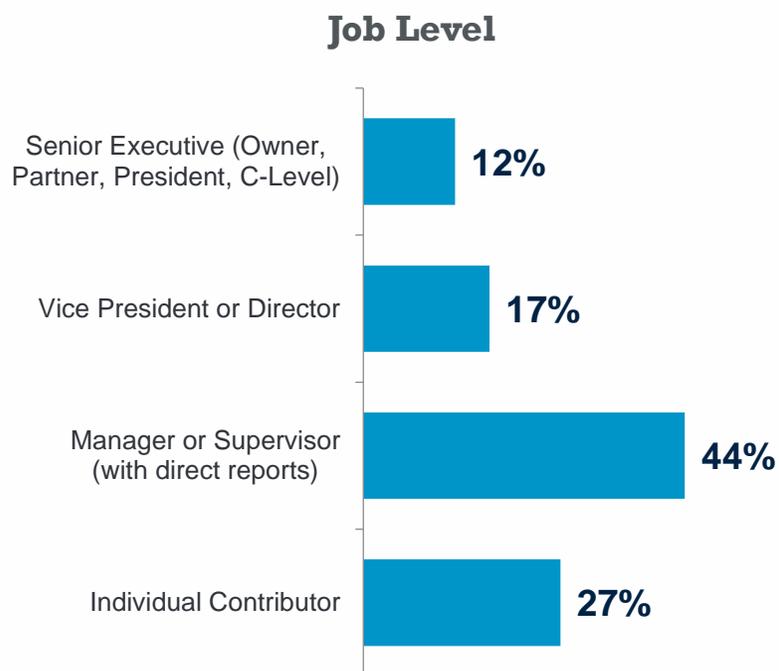*In which budget do training costs fall? (Select all that apply)*
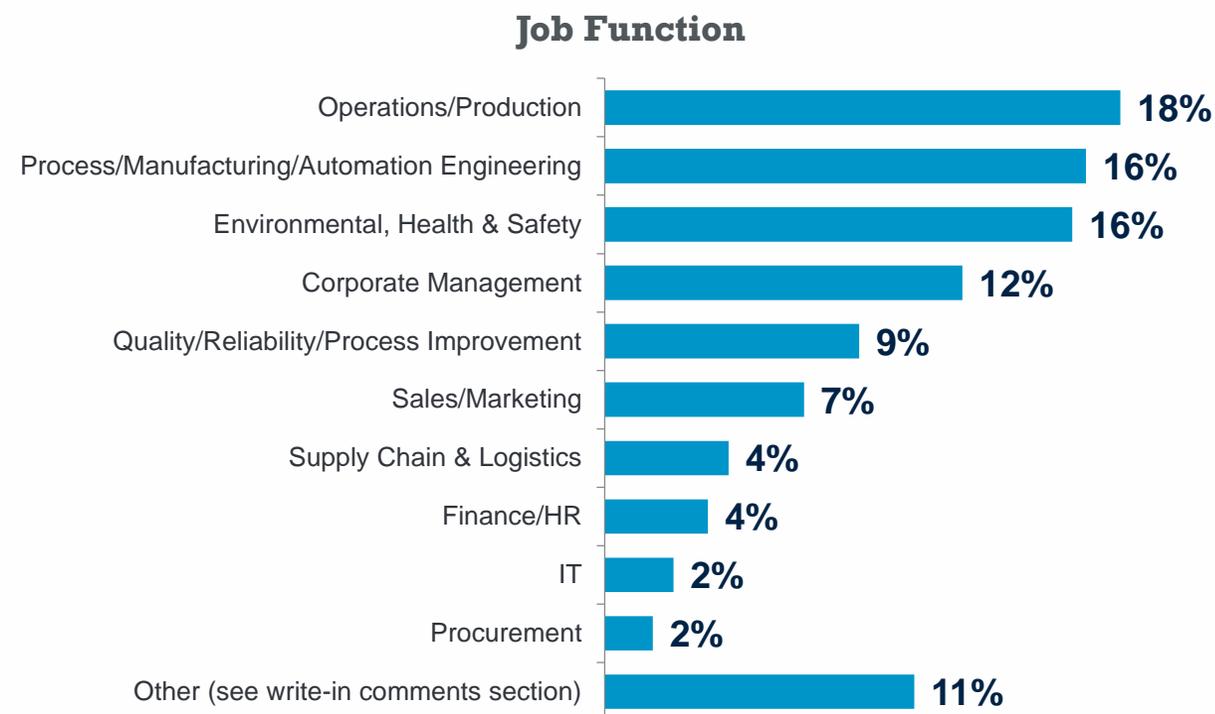
Base = All respondents (n varies from 421 to 426).

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Training Responsibility and Budget by Company Size

Training budgeting and responsibility typically falls under the responsibility of multiple departments within companies with 1,000 or more employees.

Fewer than 100 Employees

Department	Responsibility	Budget
Operations	59%	56%
HR/Training	32%	27%
Quality	22%	9%
Health & Safety	15%	18%
Continuous Improvement	11%	12%
Other (see write-in comments section)	8%	4%

100 to 999 Employees

Department	Responsibility	Budget
Operations	63%	63%
HR/Training	51%	40%
Health & Safety	35%	31%
Quality	29%	21%
Continuous Improvement	21%	14%
Other (see write-in comments section)	5%	5%

1,000 or More Employees

Department	Responsibility	Budget
Operations	72%	65%
HR/Training	66%	50%
Health & Safety	45%	27%
Quality	34%	19%
Continuous Improvement	23%	16%
Other (see write-in comments section)	4%	6%

Question: Which department owns the responsibility for training operators? (Select all that apply)

In which budget do training costs fall? (Select all that apply)

Base = All respondents (n varies from 421 to 426).

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Respondent Profile
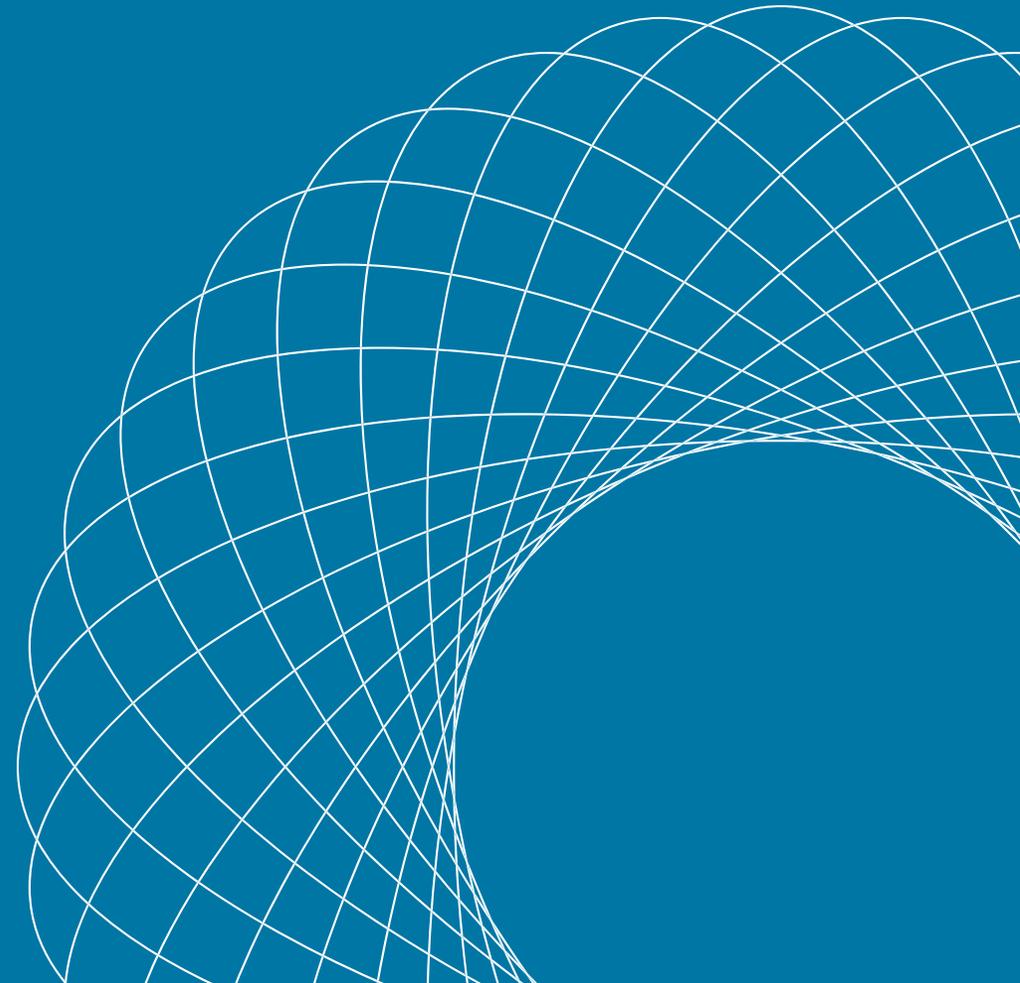
Job Description

More than fourth of respondents are senior executives, VPs or directors. The largest percentages of respondents are involved in operations/production, process/manufacturing/automation engineering, or EHS.

Job Level

Senior Executive (Owner, Partner, President, C-Level)	12%
Vice President or Director	17%
Manager or Supervisor (with direct reports)	44%
Individual Contributor	27%

Job Function

Operations/Production	18%
Process/Manufacturing/Automation Engineering	16%
Environmental, Health & Safety	16%
Corporate Management	12%
Quality/Reliability/Process Improvement	9%
Sales/Marketing	7%
Supply Chain & Logistics	4%
Finance/HR	4%
IT	2%
Procurement	2%
Other (see write-in comments section)	11%

Question: Which of the following best describes your job level?
Base = All respondents (n=426).

Question: Which of the following best describes your job function?
Base = All qualified respondents (n=426).

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Size of Operations

About one in five respondents work for companies with 5,000 or more employees, while over half work for companies with 100 to 4,999 employees, and 27% have fewer than 100 employees. More than one in four respondents indicate their company operates more than 10 plants, while 32% operate only one plant.

Number of Employees

- 5,000 or more **21%**
- Fewer than 100 **27%**
- 100 - 199 **11%**
- 200 - 499 **14%**
- 500 - 999 **10%**
- 1,000 - 4,999 **18%**

Number of Plants

1	2 to 3	4 to 5	6 to 10	More than 10
32%	20%	11%	9%	27%
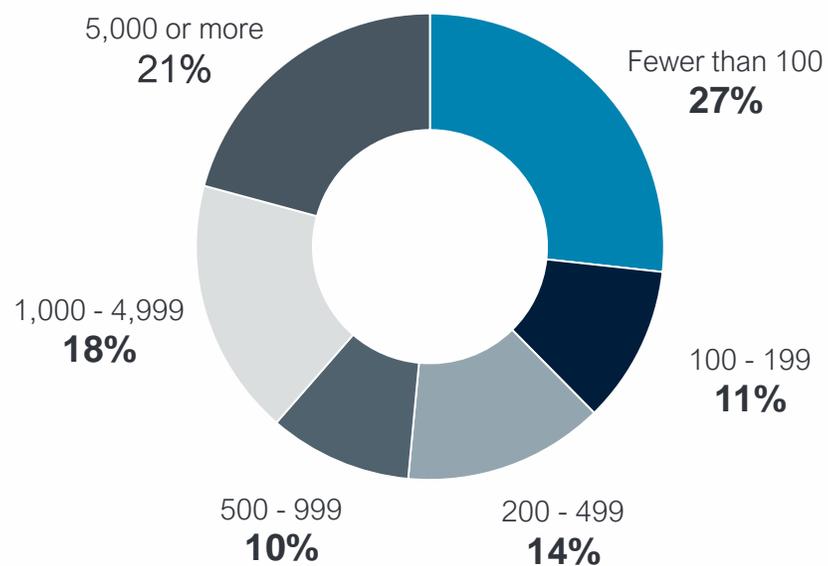
Question: What is the number of employees in your company at all locations?
Base = All qualified respondents (n=426).
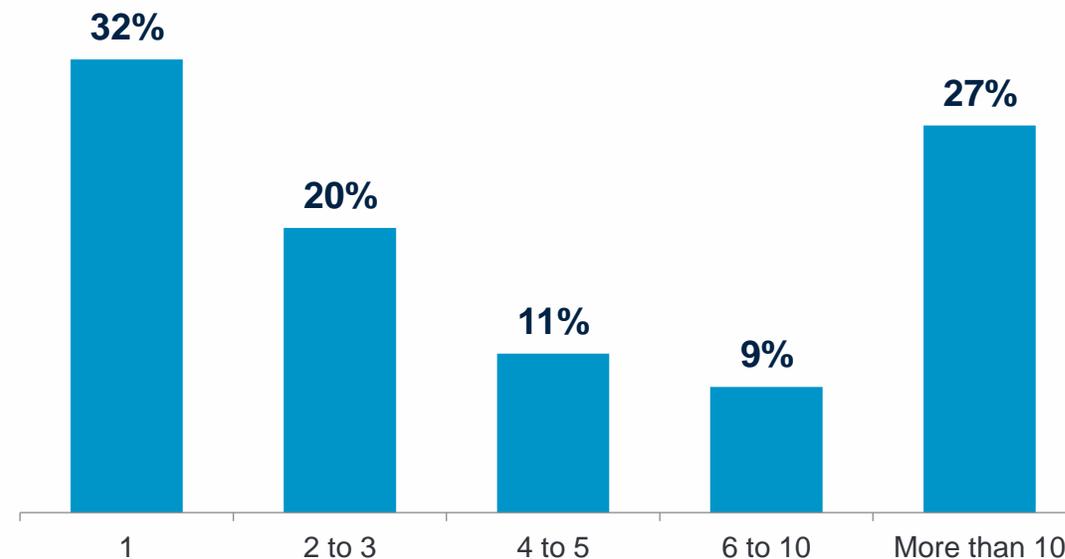
Question: How many plants does your company operate?
Base = All respondents (n=426).

Primary Business

A wide variety of businesses are represented in the sample.

Category	Percentage
Industrial Machinery	11%
Automation/Transportation Vehicles & Equipment	8%
Metals	7%
Machine Shop/Parts Fabrication	7%
Electronics/Computers/Telecom Equipment	7%
Aerospace & Defense	6%
Construction/Building Equipment	6%
Food & Beverage	5%
Plastics & Rubber Products	4%
Consumer Goods/Durables	4%
Chemicals	3%
Medical Devices/Lab Equipment	3%
Wood Products/Furniture	3%
Petroleum & Gas/Coal	2%
Apparel/Textiles	2%
Pharmaceuticals/Healthcare	1%
Pulp & Paper	1%
Other (see write-in comments section)	19%

Question: What is your company's primary product at your location/division?
Base = All respondents (n=426).

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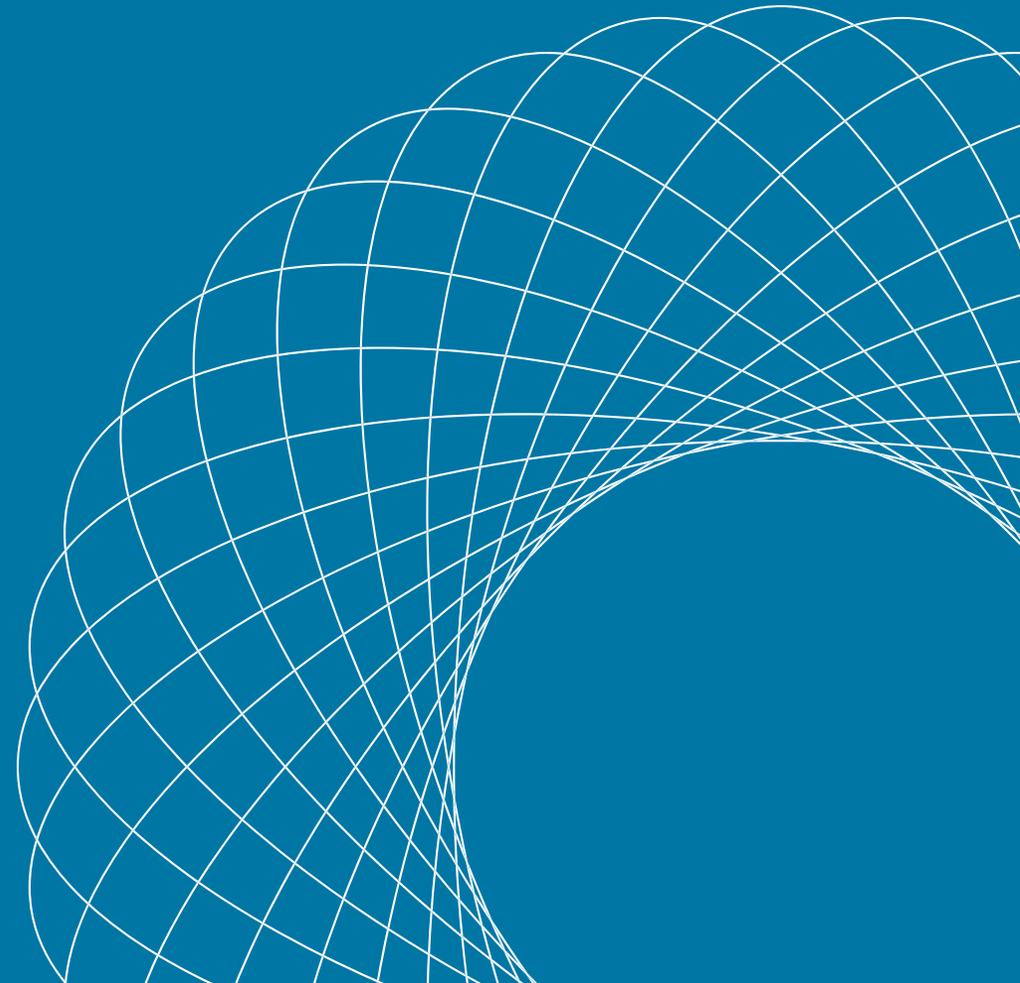
Write-in Comments

Write-in Comments

1. Which of the following best describes your job function? Other responses:

- Administrative
- Administrative / executive support
- All of it
- Consulting in Operations and Business Excellence
- Customer Service Administrator/Inside Sales
- Design & engineering management
- Design and Development
- Design Engineering *(3 mentions)*
- Development and Application Engineering
- Engineering *(3 mentions)*
- Facilities
- Facilities Engineering & Maintenance

- General Manager
- Instructional Designer / Training Consultant
- Knowledge Management
- Lean, Continuous Improvement
- Maintenance
- Maintenance technician *(2 mentions)*
- Maintenance/Safety
- Manufacture and install
- Many of the above responsibilities
- Mechanic
- Organizational Development
- Product Engineering

- Product Stewardship
- Purchasing and Inventory Control
- Purchasing/Office Manager
- Quality Systems
- R&D *(3 mentions)*
- Regulatory
- Research & Development
- S&H Trainer
- Skill Trades
- Technical Service
- Technical Training
- Test and evaluation

Write-in Comments

2. What is your company's primary product at your location/division? Other responses:

- 3PL
- Agricultural *(2 mentions)*
- Aircraft, sales, Leasing and Management
- Airport Operation
- Automatic Data Capture Devices
- Automotive aftermarket
- Battery Packs for Medical & Military
- Biomedical
- Book Manufacturing
- Building materials
- Calibration
- Clean room supplies
- Commercial Printing
- Containers
- Contract manufacturing
- Dental Lab
- Diesel engines
- Direct Mail
- Distribution
- Distribution, hydraulic, pneumatic, electronic
- Diversified manufacturer: CPG, industrial, municipalities, government, commercial
- Electrical Equipment
- Energy services
- Engineered wood products
- Facilities Management

- Fittings, valves
- Forklifts
- Government *(3 mentions)*
- Hermetic Wire & Fiber Optic Seals
- HVAC sheet metal fabrication
- Hydraulic Systems for Renewables
- I&E (Instrumentation and Electrical)
- Identification products
- Industrial Distribution
- Instrumentation and Controls
- Insurance *(2 mentions)*
- Iron castings
- Lighting
- Machinery repair
- Manufacturing *(2 mentions)*
- Manufactured homes
- Manufacturing of wall covering, wall protection
- Metal Shelving manufacturing
- Metal, Wood, Plastic Furniture.....
- Mining
- Moldmaking
- Motion picture industry
- Oil Field Service
- Packaging
- Packaging for Table Grapes
- Passenger Transportation

- Passive Fireproofing
- Pipe line welding - fabrication
- Power distribution equipment
- Power generation equipment
- Printing Company
- Professional services
- Project Engineering & Management
- Research & development engineering center
- Rigid PCBs, Flex and Rigid-Flex PCBs, Battery Packs, Human-Machine Interfaces, Cable Assemblies, EC Fans and Motors, RF Products
- Shared Mail
- Soft Home Fashion
- Software *(3 mentions)*
- Steel Castings for cement &Steel plant
- Steel fabrication and erection.
- Tacoma Truck Beds
- Tape
- Telecommunications
- Thermal solar energy equipment
- Tissue paper machinery
- Utility *(2 mentions)*
- Vending solutions and machines
- We are too diversified to narrow it down
- Wire & cable
- Wood panel product (OSB)

Write-in Comments

3. To what extent do you use the following training delivery methods for your operators? Other responses:

- Apprenticeship
- Departmental Meetings
- Hands on
- Hire already certified with many years experience
- In house training sessions
- In-house approved training
- Individual Counsel
- Informal talk / demo

- Monthly lunch
- On the job training
- On the floor group meetings
- Operator master
- Practice units
- Safety associations
- Senior
- Sop docs

- Supervisor one on one
- Technical Seminars
- Toolbox talks training sessions
- Trade
- Vendor / Convention Seminars
- Workshops, OJT

4. What training method have you found to be most effective? Other responses:

- Blended
- Combination Classroom, On the Floor & Online.
- Combination of above
- Hands on
- In house training

- Incentives
- Industry talent
- On the floor group sessions
- Supervisor one on one
- We are office environment work

- We have recruited a unique training matrix that has helped us to be a World Class Manufacturer
- Workshops

5. What medium is your training content? Other responses:

- 80/20 implementation / presentation
- Direct contact by showing
- Discussion & Demonstration
- Electronic training system
- Face to face (2 mentions)
- Floor training
- Graphical work instructions
- Hands on (9 mentions)
- In shop machines

- Interactive digital delivery
- Interactive Exercises
- Job Breakdown Sheets
- Kenistetic
- Litmos (www.litmos.com)
- Live instructor (2 mentions)
- Mentoring/Shadowing (5 mentions)
- Mixed
- On the job (3 mentions)

- Presentation
- Reality based
- Simulator
- Specialized Training Matrix
- Spoken
- Task orientation
- Team Training
- Train as needed
- Verbal (9 mentions)

Write-in Comments

6. What are the biggest challenges you face in training your factory workers? Other responses:

- Balancing needs for training vs production
- Classroom space not available
- Convincing employer its necessary
- Lack of internal follow thru with trained information
- Language barrier - three languages spoken here

- Language barriers *(2 mentions)*
- New employees training new employees
- Our Training Matrix eliminates challenges
- Scope of training required for proficiency is large taking months to years to accumulate.

- Self initiated application of info retained
- Trainee aptitude

7. How are you currently assessing the skills of your operators? Other responses:

- Agile coding
- Customer returns
- Demonstrated ability (observed but unsupervised)
- Deviations from standard operating procedures
- Efficiency reports

- Meeting KPI metrics after training
- Observations
- Oral competency reviews
- Production output
- Quality of work performed

- Quality testing
- Self-evaluation
- We do not do assessments

Write-in Comments

8. How are you currently tracking the skills of your operators? Other responses:

- Actual output
- Annual review of skills
- Auto tracking using a program for training & completion
- Company software
- Compliantpro
- Computer
- Corporate system
- Dedicated program
- Digital structured review process
- Dispassionate personal observation
- Finished product inspection
- Homegrown software package
- HR System
- I have no idea

- Internal electronic tools
- Internal quality system
- Intranet training Database
- Isnetworld; PEC Premier
- Managers memory
- Observation and results
- Online assessment
- Participation
- Pec - ISN
- Performance
- Performance evaluation
- Plex
- Productivity
- Safety Database

- Salesforce
- Shared Smartsheet with multiple inputs
- Software specialized
- Specialized Training Matrix
- System alerts
- Tracking Program
- Training Database – 2 mentions
- Training Matrix - posted at worksite
- Training Web Site
- Unipoint
- Web Database
- While working with machines
- Work performed

9. What KPIs do you use to measure the effectiveness of your training program? Other responses:

- Collective ranking of oral competency checks
- Customer satisfaction
- Evaluation records

- Feedback Forms
- Increased income aggregates
- Lost Time from training

- OSHA Recordables
- Supervisor comments
- Training hour

Write-in Comments

10. How often do you re-evaluate your workers' skills? Other responses:

- 1 year quarterly then semi annual
- 6 months *(3 mentions)*
- 8 month intervals
- As needed *(2 mentions)*
- As needed or every 2 years
- At least monthly. More frequently if there is an indication that greater review is needed.
- Based on legal and other requirements

- Daily *(3 mentions)*
- Daily and weekly
- Every six months
- Monthly
- Na once qualified and they've been on the job in the past 6 months
- On going
- Once their production trends downward

- Ongoing evaluation
- Ongoing real time basis
- Regulatory Based
- Weekly
- Weekly reports
- When daily metrics drop below targets
- When they run scrap

11. What are your biggest challenges related to training content creation? Other responses:

- Cost and time of development
- Finding the right SME
- Individual retention and comprehension
- Knowledge and money

- Language Barriers
- Spanish translation for all to understand
- Staff/trainer shortage and time constraints
- Time is the factor

- Time of developer
- Time to complete
- Trainer skill sets

## 12. Which department owns the responsibility for training operators? Other responses:

- All of the above
- Business Units
- Department Specific
- HR (Health & Safety), Quality, Production (CI, Operations) all take part of training
- Individual production departments
- Industrial engineering

- Maintenance
- Manufacturing *(2 mentions)*
- Ops Administration
- Owner
- Production/Training
- R&D
- Shift Supervisors and Department Foremen

- Software programmers
- Supervisor
- Technical
- The department the operator is placed
- Training and development
- Vice President

Write-in Comments

13. In which budget do training costs fall? Other responses:

- Administrative
- All
- Departmental budget
- Education Grant

- Individual production departments
- Industrial engineering
- Overhead
- R&D

- Regulatory
- The department where training occurs
- Training and development

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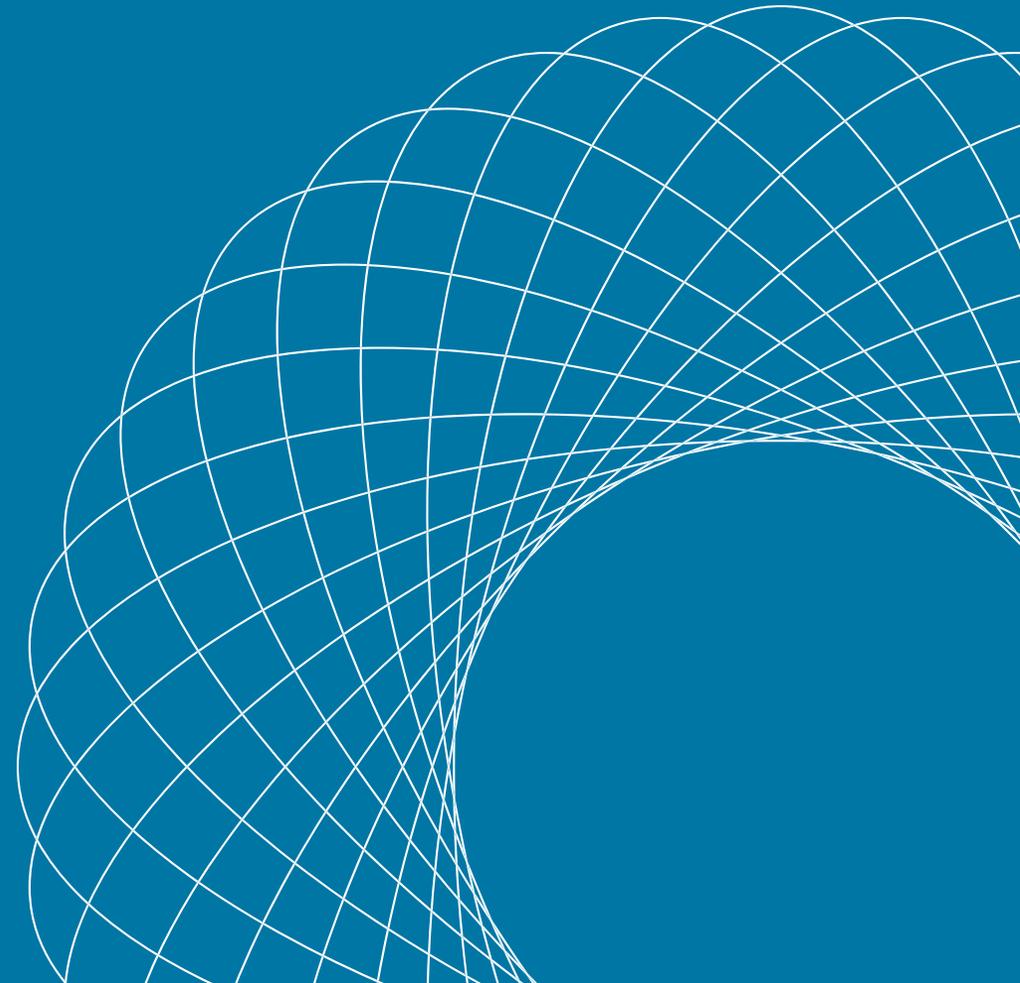
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