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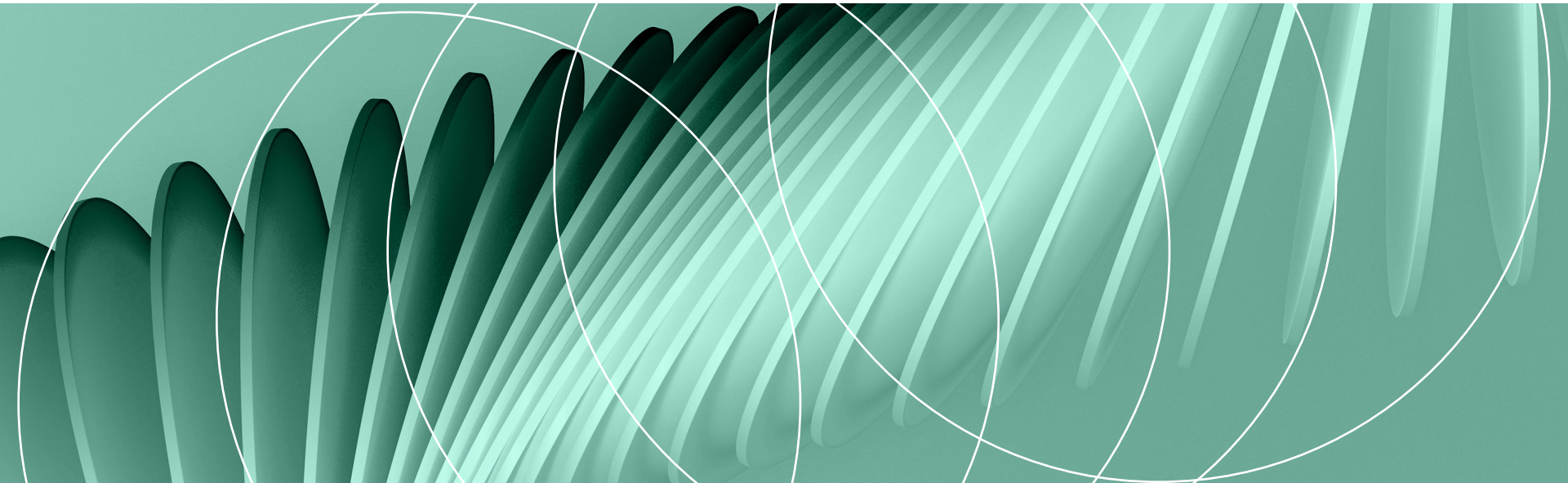
Manufacturing Spotlight: Enhancing Learning And Development With Mixed Reality

A COMMISSIONED STUDY CONDUCTED BY FORRESTER CONSULTING ON BEHALF OF META, APRIL 2025



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Executive Summary

Manufacturers in a diverse range of sectors including technology, industrial, chemical, automotive, packaged goods, and electronics are embracing mixed reality technologies in training, onboarding, and learning and development (L&D) programs.

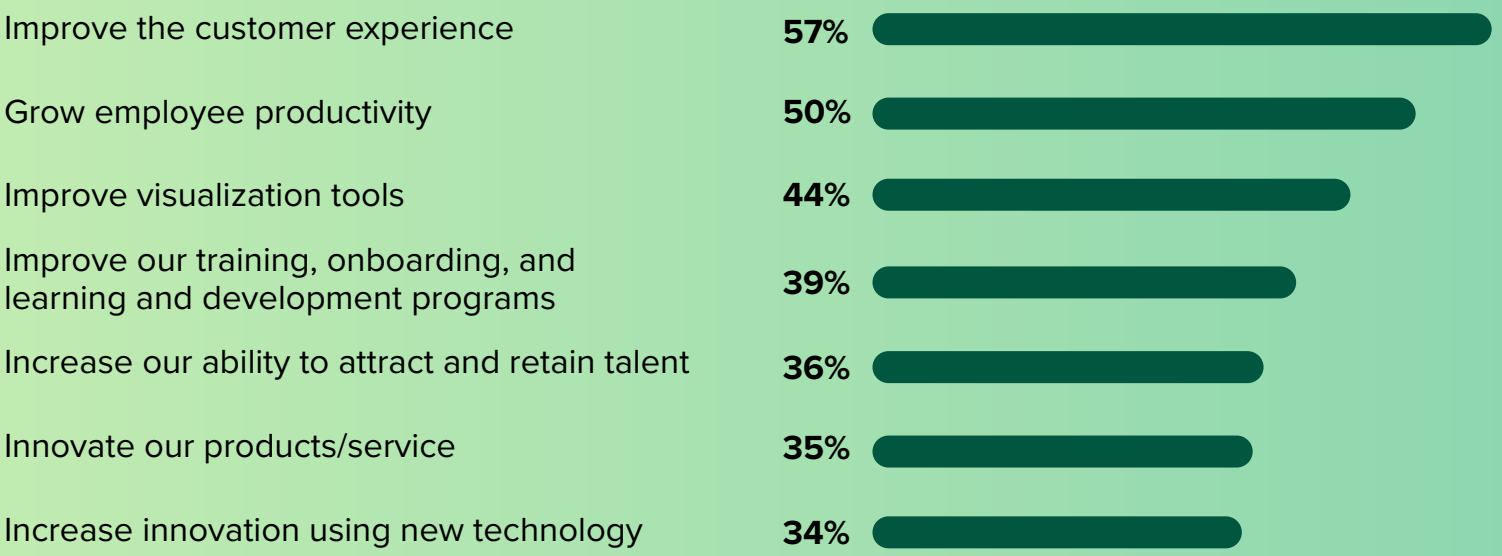
Mixed reality use cases in manufacturing include visualizations, simulations, and collaborative training experiences. Nine out of 10 manufacturers orient employees to mixed reality learning in less than an hour, making learning realistic and helping employees retain the content.

Manufacturing leaders report high satisfaction with mixed reality, and many plan to expand use in the coming years as they anticipate benefits of increased productivity, improved safety, and better employee retention.

Manufacturers' Critical Priorities For The Year Are Improving Their Customer Experiences And Growing Employee Productivity

Additional priorities of improving visualization tools and improving learning and development programs can help manufacturers grow productivity.

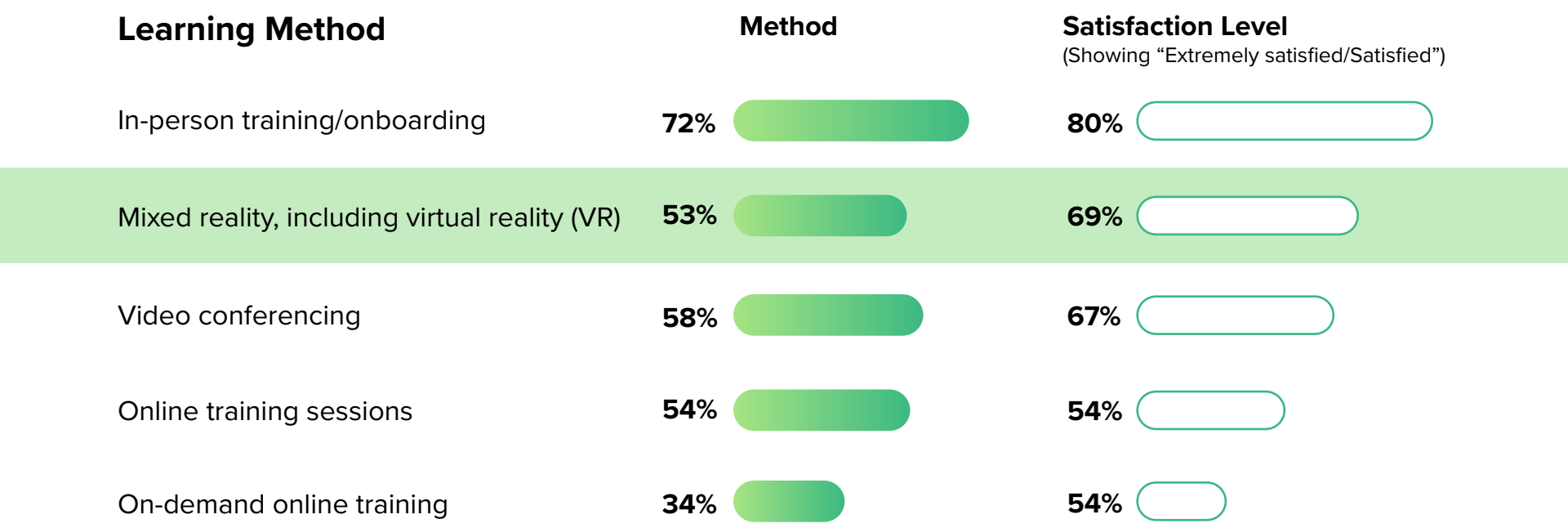
Critical Priorities For The Year



4 Base: 108 decision-makers involved in learning and development technology decisions in manufacturing organizations in North America and Europe
Source: A commissioned study conducted by Forrester Consulting on behalf of Meta, April 2025

Mixed Reality Is A Key Tool For Visualization And Learning And Development

Mixed reality is emerging as a top choice as a learning and development method, with manufacturers citing higher satisfaction rates compared to video conferencing and online training.



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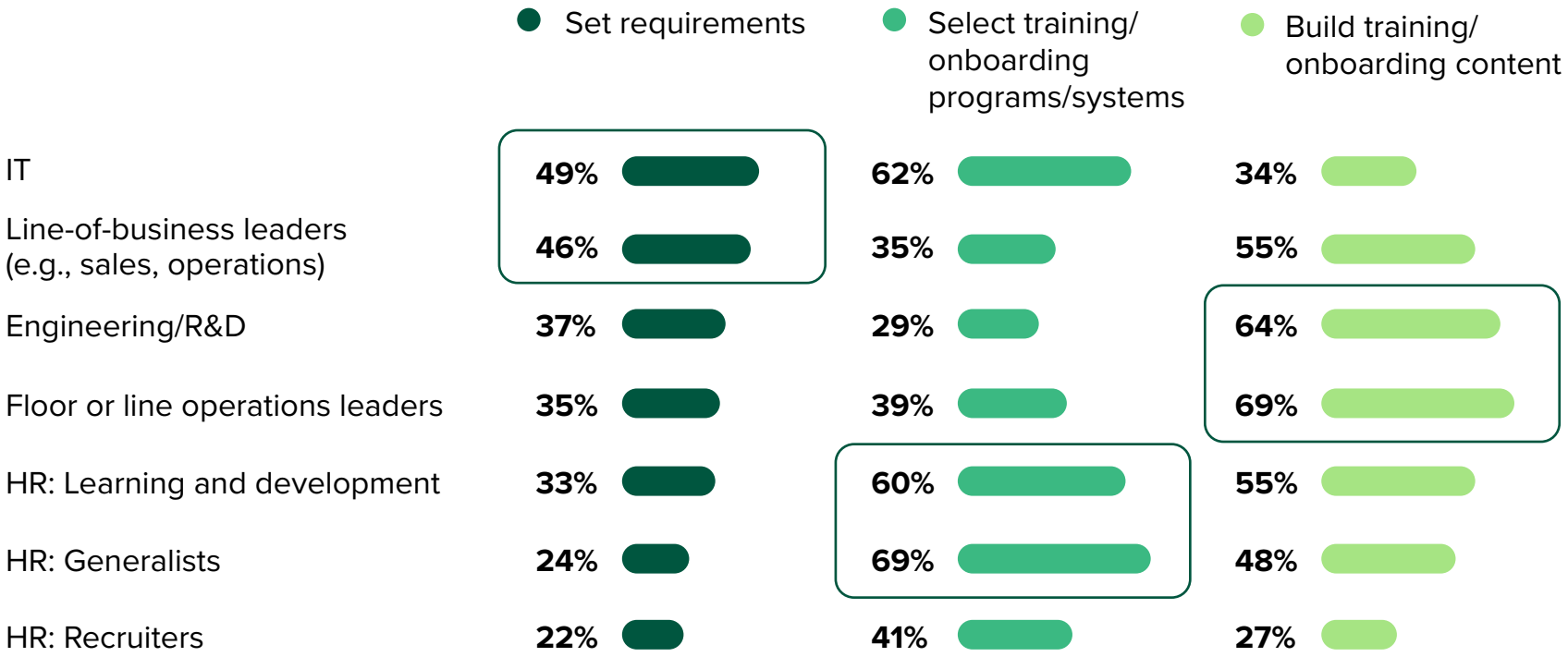
Specialized Teams Are Responsible For Each Stage Of Designing L&D Programs

"How are each of the following teams involved in designing training, onboarding, and learning and development programs/systems for your organization?"



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Mixed Reality Makes L&D More Realistic, Safe, And Engaging

In manufacturing, mixed reality allows employees to engage with content in a low-risk and realistic way.

REALISTIC

76%

Agree mixed reality visualizations make training and onboarding more realistic

SAFE

75%

Agree mixed reality helps manufacturing organizations train employees for dangerous situations in a low-risk environment

ENGAGING

70%

Agree that mixed reality helps employees engage with content

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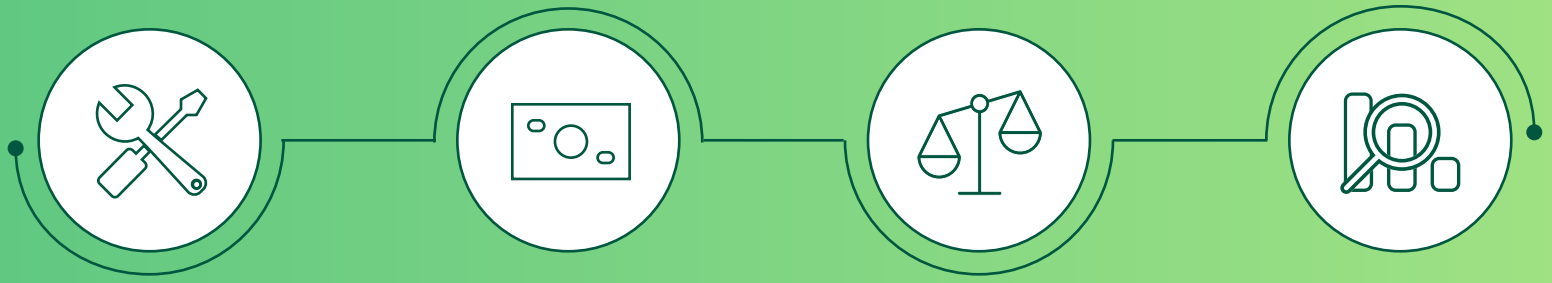
Mixed Reality Adoption Hurdles

Manufacturing companies must invest to overcome adoption barriers. However, they are challenged by cost concerns and competing priorities on budgets. Thinking through how mixed reality can solve business problems is a critical step.

“Which of the following barriers, if any, do you anticipate your organization will face/ has your organization faced in deploying mixed reality solutions?”



Lack of the right resources and skill sets required to implement the technology

Total cost concerns

Competing priorities/ budgets

Lack of insight into the kinds of business problems the technology can solve

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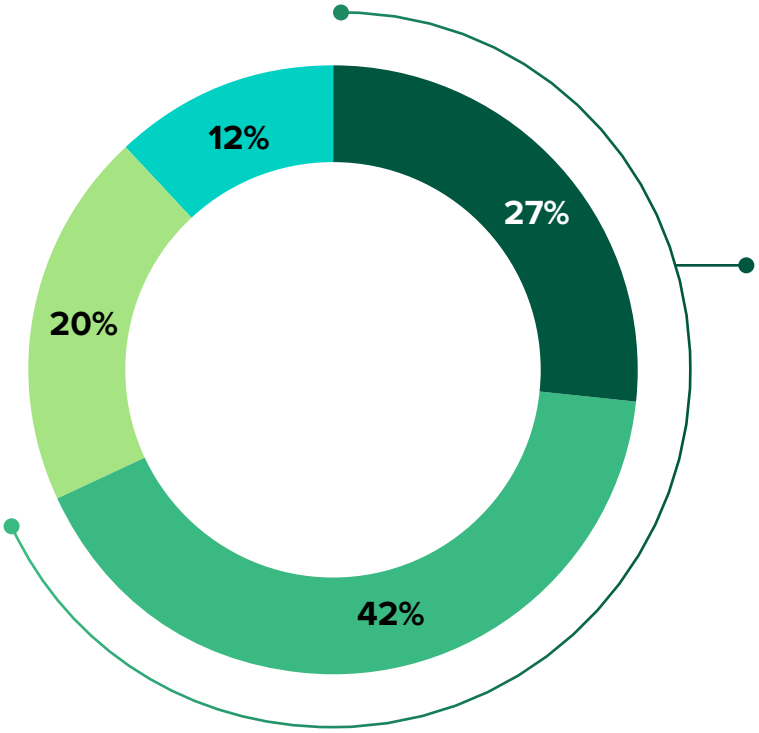
Despite Challenges, 69% Plan To Expand Mixed Reality Use Within Two Years

“When does your organization plan to expand mixed reality usage?”

- In the next 12 to 24 months
- This year
- In more than two years
- We do not plan to expand our usage of mixed reality/VR in training and onboarding



69%

plan to expand mixed reality usage within 2 years

Base: 60 decision-makers involved in learning and development technology decisions in manufacturing organizations in North America and Europe
Note: Percentages do not total 10 because of rounding.
Source: A commissioned study conducted by Forrester Consulting on behalf of Meta, April 2025

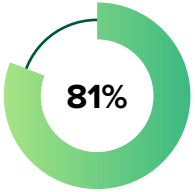
Mixed Reality Can Solve Future L&D Needs

Manufacturing companies are currently integrating mixed reality into many of their L&D use cases, such as visualizations of complex machinery for planning and inspection and maintenance workflows.

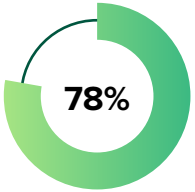
As they look toward the future, the breadth of use cases is expected to grow in many areas including safety-practice training, simulation and testing, and visualizations of processes in real time via digital twins.

74% Agree mixed reality will play a bigger role in future learning and development efforts

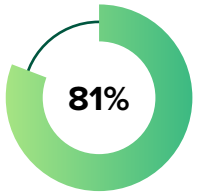
Future Use Cases For Mixed Reality



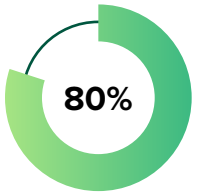
Visualizations of complex machinery for planning



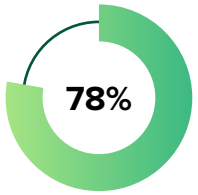
Simulation and testing for new employees



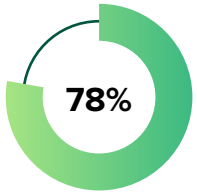
Safety-practice training, simulation, and testing for compliance



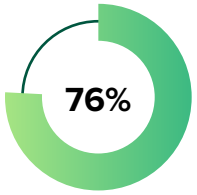
Visualizations of inspection and maintenance workflows



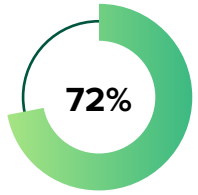
Safety practice training, simulation, and testing for onboarding



Visualizations of processes in real time via digital twins for managing complex systems and servicing equipment



Visualizations of factory space for design and redesign



Collaborative training experiences with multiple personnel

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Implementing Mixed Reality Into L&D Programs Improves Quality And Productivity

“Which of the following benefits do you anticipate or have you realized as a result of implementing mixed reality/VR in your training and onboarding programs?”

Top 10 Benefits Of Mixed Reality

1. Higher quality of work/less need for rework
2. Increases in worker productivity
3. Boost retention/lower attrition among employees
4. Higher rates of employee safety/lower rates of safety incidents
5. Increases in overall facility productivity
6. Transfer of knowledge from retiring workers to new workers
7. Faster designing of manufacturing spaces
8. Reduced overall business risk to operations
9. Improved employee experience
10. Better candidate conversion rates in hiring

More Than Three-quarters Expect Improved Employee Experience And Productivity

Manufacturing leaders agree that mixed reality has broader impacts on organizations' business metrics.

"What impact do you anticipate mixed reality/VR in training and onboarding will have on each of the following business metrics?"

77%

Positive impact on employee experience

75%

Positive impact on worker productivity

74%

Positive impact on growing employee retention

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Key Recommendations

Mixed reality for learning, onboarding, and training has particular efficacy for manufacturing firms. By its very nature, manufacturing involves a great deal of in-person, physical processes. Simulating manufacturing facilities, procedures, processes, and products can help employees learn the ropes more quickly, generating "muscle memory" as they simulate usage. Leaders in manufacturing should consider the following when considering mixed reality for their learning, onboarding, and training efforts:

Address the retirement crisis with mixed reality. As manufacturing employees in their 50s and 60s head toward retirement, manufacturing leaders consistently cite their retirement as a business risk. Digitizing the knowledge of these tenured employees is crucial to passing along knowledge of operations to the next generation of workers. But doing so in mixed reality can increase the fidelity, accuracy, and effectiveness of training. As a bonus, recruiting younger employees with the use of mixed reality training promises to improve recruitment rates.

Track key performance indicators, then iterate and expand. Key performance indicators for mixed reality include higher quality of work, increases in worker productivity, higher employee retention, and lower rates of safety incidents. Tracking these KPIs and comparing them to alternative forms of training can help you identify areas in which mixed reality strongly outshines other channels. This is crucial to building a business case for expanding mixed reality training programs to other areas of your workflow and organization.

Align the appropriate resources when developing mixed reality solutions. Building successful mixed reality training solutions is a team effort. IT and line-of-business leaders play a key role up front in setting requirements. HR L&D and other HR professionals help select the mixed reality learning platform, and engineering/R&D and floor or line operations leaders play a central role in building content. Align these roles into a cohesive cross-functional group to drive successful design efforts.

Methodology

In this study, Forrester conducted an online survey of 108 leaders in business, IT, and human resources at large manufacturing organizations in North America and Europe. The study began and was completed in March 2025.

Demographics

MANUFACTURING SECTOR	
Technology hardware and consumer electronics	**27%**
Industrial products, machinery, electrical equipment, and construction materials	**20%**
Chemicals and plastic production	**9%**
Automotive and transportation equipment	**9%**
Consumer packaged goods/packaged food and beverage	**9%**
Industrial electronics	**7%**
Other	**19%**

COMPANY SIZE	
1,000 to 4,999 employees	**41%**
5,000 to 19,999 employees	**34%**
20,000+ employees	**25%**

JOB TITLE	
IT leader	**51%**
Business leader	**33%**
HR leader	**16%**

COUNTRY	
US	**27%**
Canada	**22%**
Spain	**14%**
Germany	**14%**
United Kingdom	**12%**
France	**11%**

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