BRICKxMR Market Research Survey Report (for internal use only)

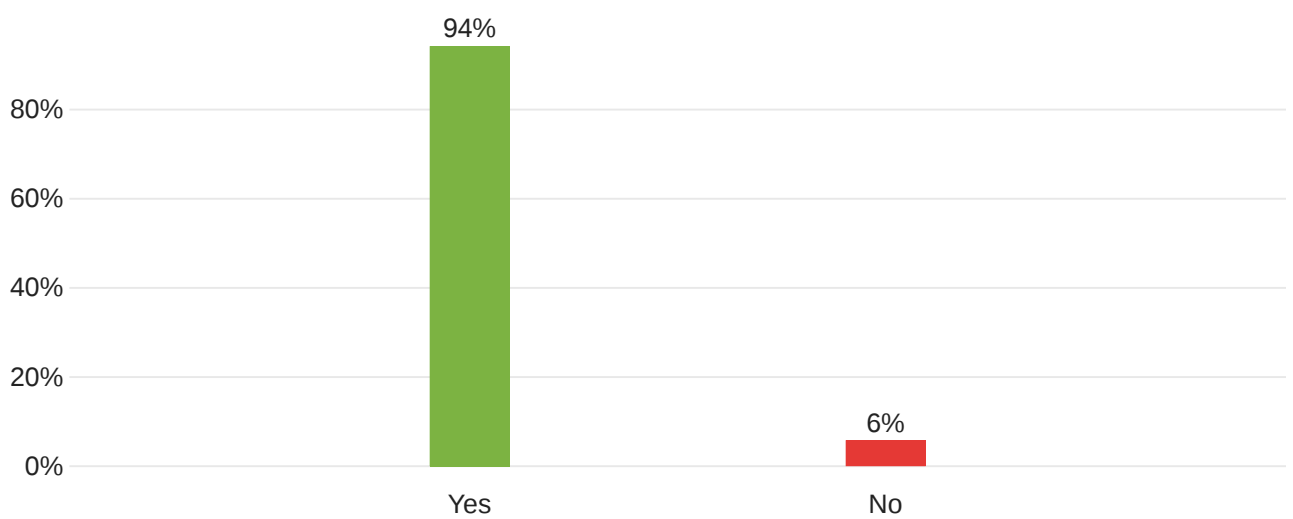
In this report, we present the findings and analysis of the data collected in our comprehensive study on construction training. The purpose of this study was to gain insights into the current state of training practices within the construction industry and to identify areas for improvement. Through a meticulous data collection process, we have gathered valuable information from a diverse range of participants, including industry professionals.

By examining the data, we aim to provide a comprehensive overview of the challenges and opportunities in construction training, as well as highlight key trends and patterns that emerged during the study. The insights derived from this data will serve as a foundation for driving innovation and enhancing training practices within the industry.

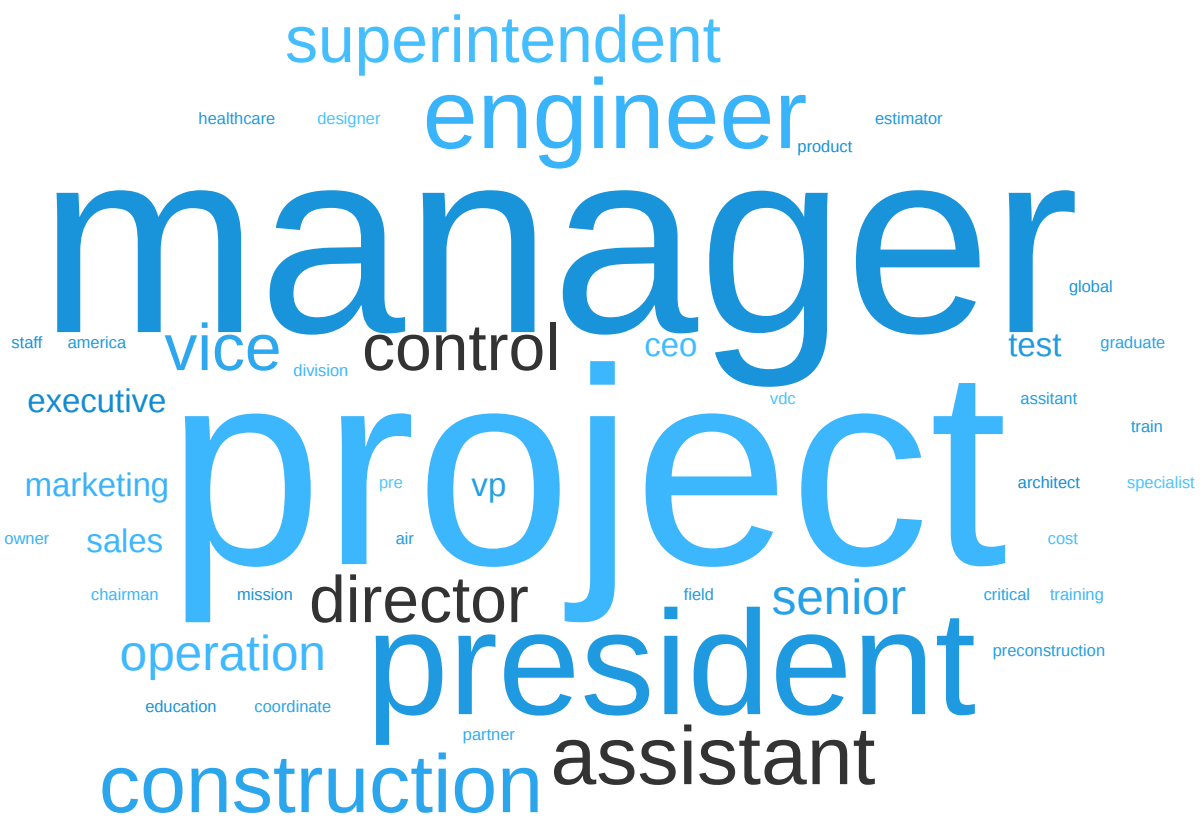
The respondents' valuable input has been instrumental in shaping the outcomes of this study. It is our hope that this report will serve as a valuable resource for the proposal grant and our research team, enabling us to make informed decisions and implement effective strategies to improve construction training.

Q5 - Are you currently a full-time employee of a construction and/or related assembly/prefabrication/installation company?

52 Responses



Q6 - What is your Job Title?



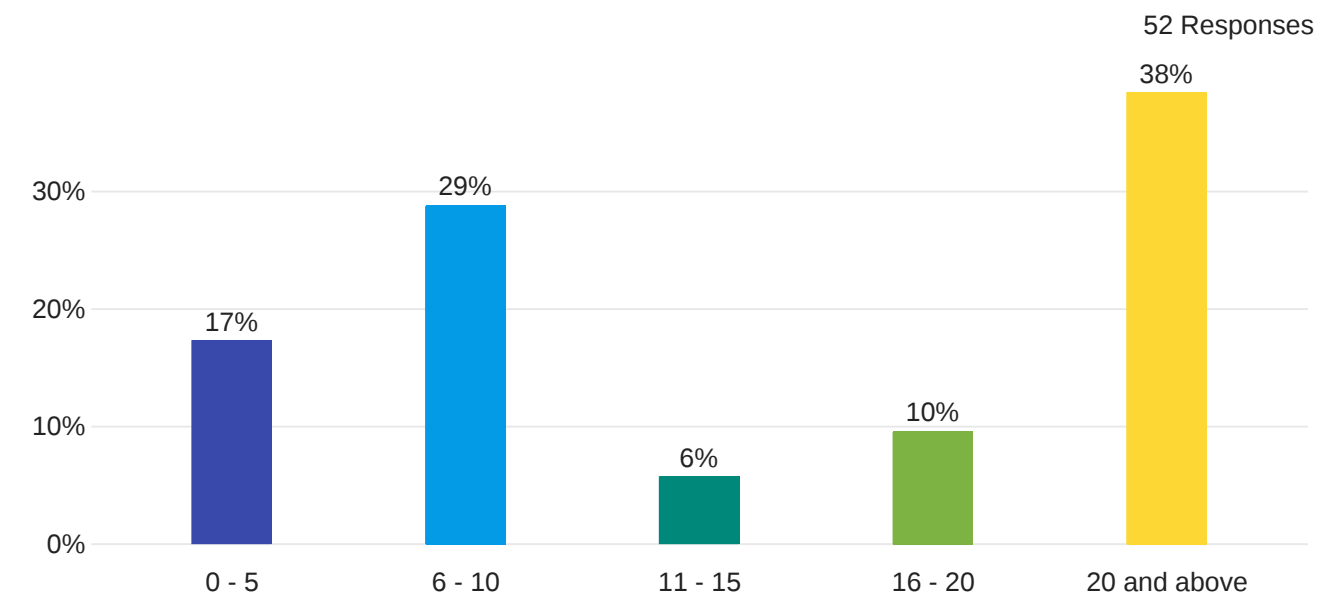
Q6 - What is your Job Title?

What is your Job Title?
Vdc engineer
Project Manager
Field Engineer
President
Project Manager
Partner/Project Manager
Vice President
Test
Chairman/CEO
Assistant superintendent
President / Owner

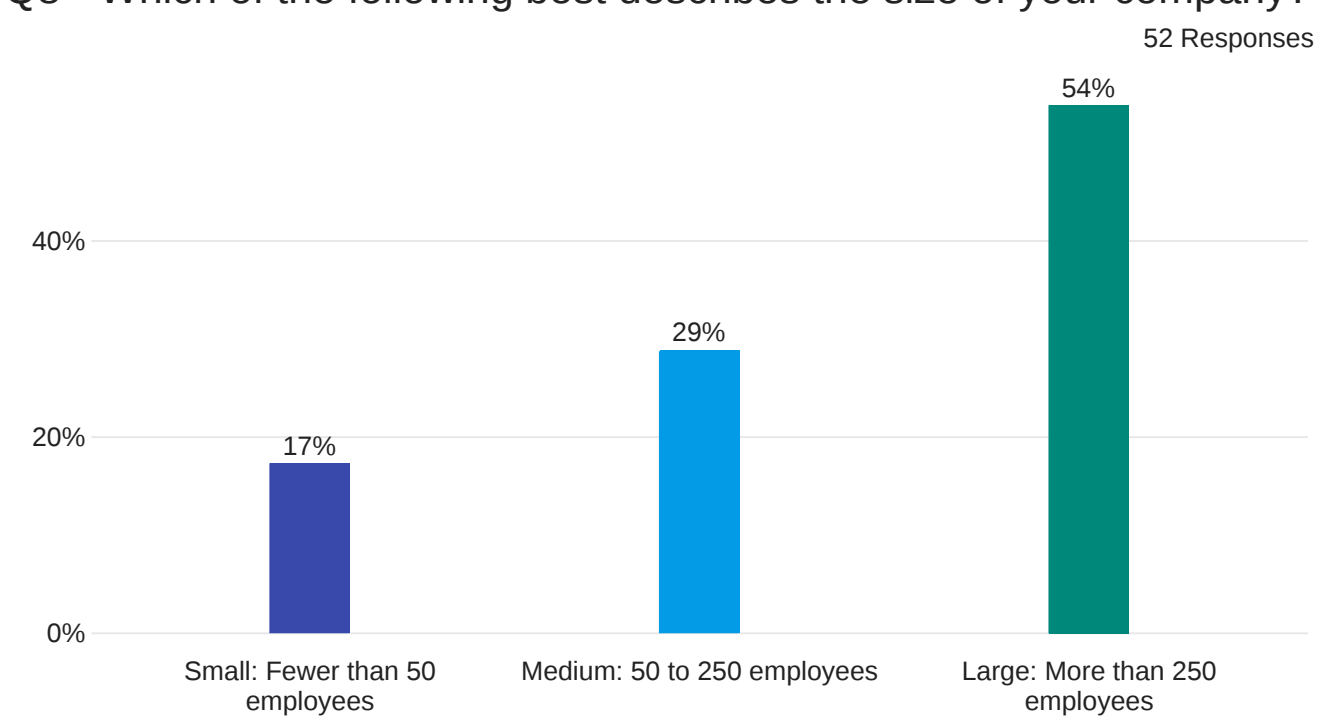
Project Manager
Project Manager
Executive Vice President
VP, Operations
Vice President, Operations
Assitant Project Manager
General Manager, Mission Critical
President
Project Manager
President
Director of Construction
Vice President of Operations
Division President
CEO
Director of Sales and Marketing
Director of Marketing
VP of Construction
Estimator
Project Controls - Cost Manager
Project Controls Engineer
Staff Project Controls Specialist
Graduate architect
Senior Preconstruction Manager
Sales Executive Healthcare
Test
EH&S Global Training Coordinator
Senior Trainer, Construction Education
Designer
Pre construction engineer
Project Controls Manager
Assistant Superintendent
Project Engineer
EH&S Manager

Director of Construction, Air Products America
Assistant Project Manager
Assistant Superintendent
Project Manager
Project Manager
Senior Project Engineer
Assistant superintendent
Project Manager

Q7 - How many years of experience do you have in the AEC (Architecture, Engineering, Construction) Industry?

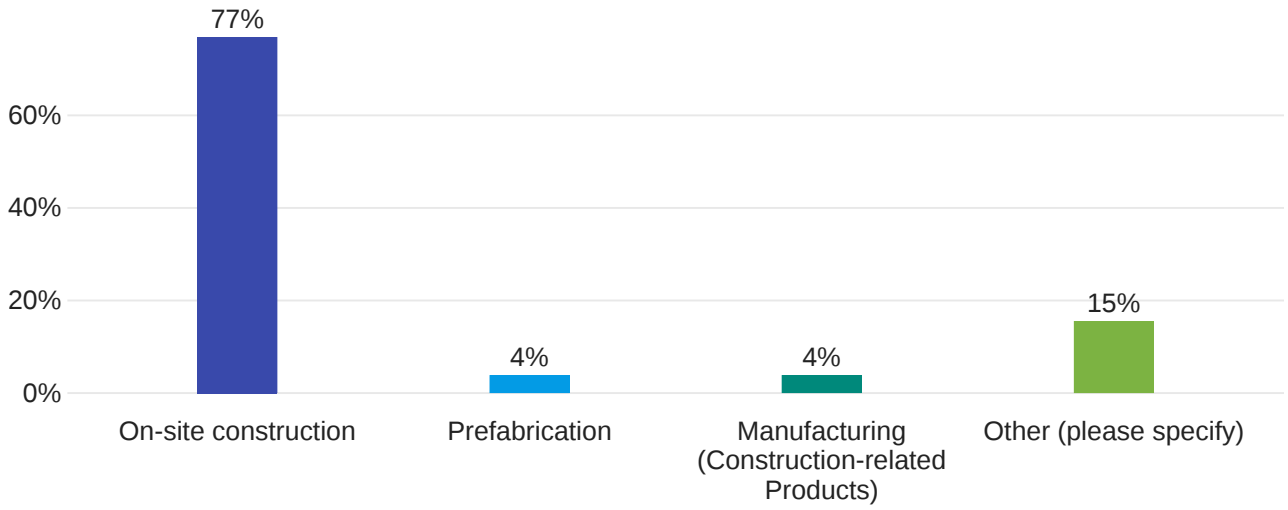


Q8 - Which of the following best describes the size of your company?



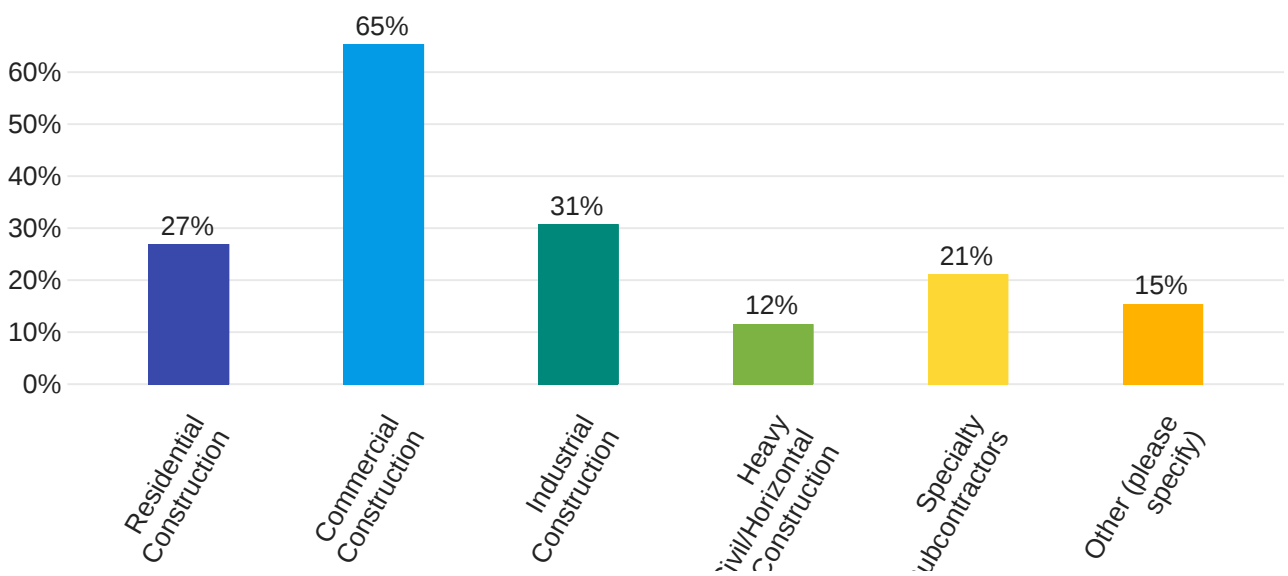
Q9 - What best describes the nature of your company's business? - Selected Choice

52 Responses



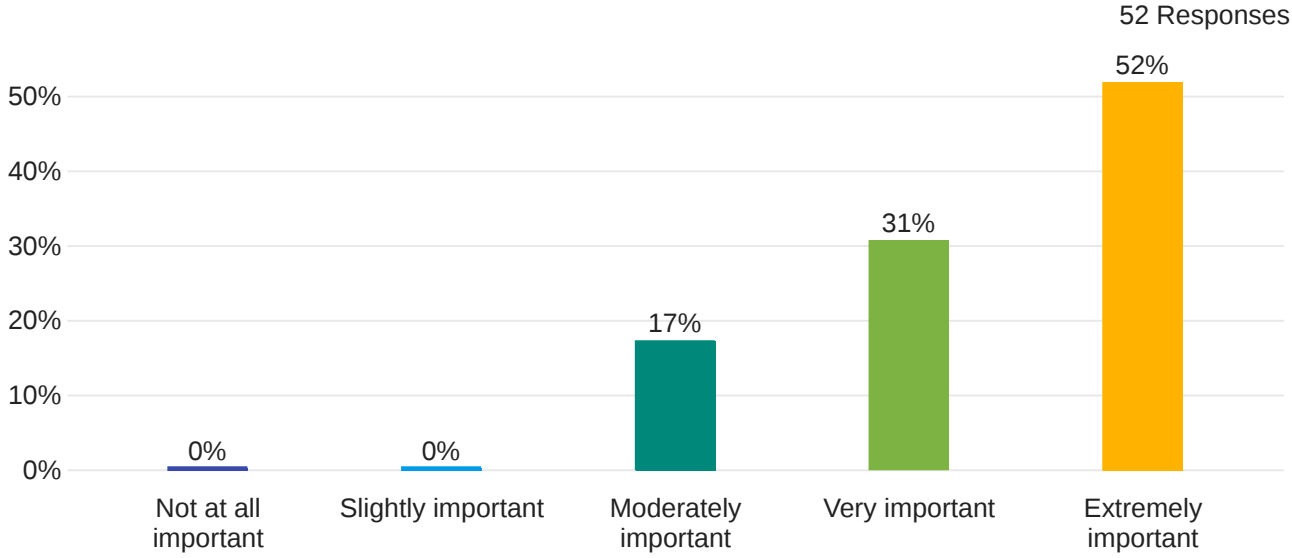
Q10 - What industry sector does your organization cater to? - Selected Choice

52 Responses



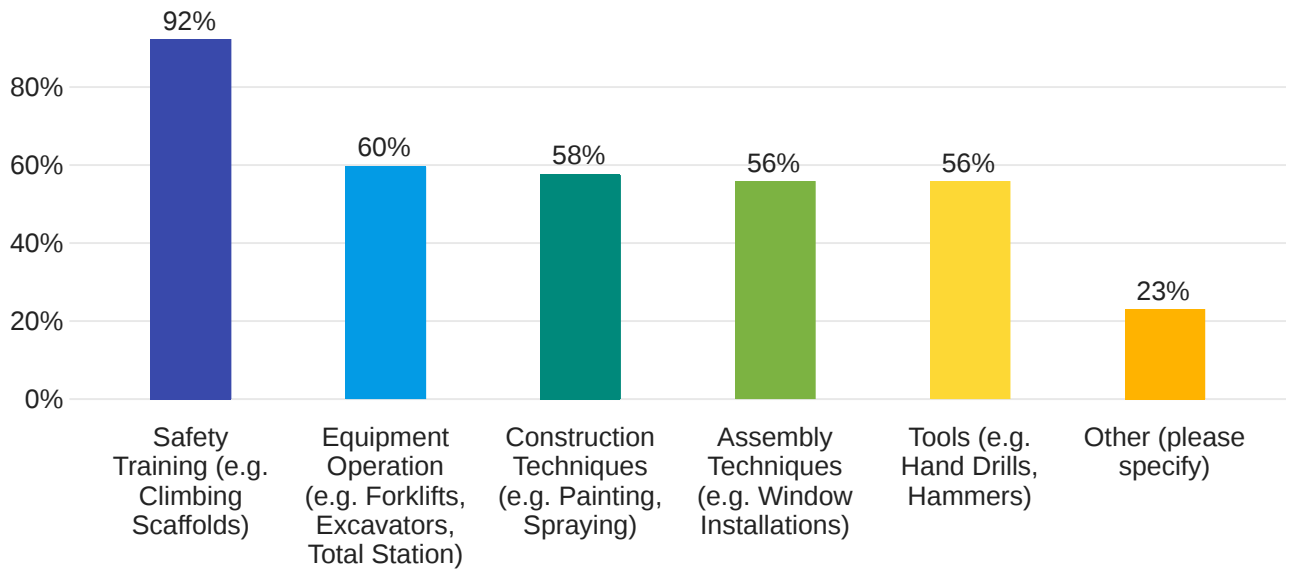
Q11 - How important is it for your organization to provide practical construction training?

52 Responses



Q12 - Select the topics that are important to your organization to include in practical construction training? (Select all that apply) - Selected Choice

52 Responses



Q12_6_TEXT - Other (please specify) - Text

Other (please specify) - Text
Supervision, management, leadership, lean practices
All of the above apply to our craft in the field. The field craft leaders also receive specific leader training. Our admin staff go through a series of other trainings.
Construction Layout/Shoot ting of elevations/Site Grading
Software training-P6, Best Practices in construction training
Schedules, Financials, Risk Management
Quality Control
People skills/communication
Overall all aspects of building a home. We have to know what’s right from wrong
Temporary walls are pre-con and the securing is most important
Construction project management (estimating, scheduling, etc)
Wildlife
Line of fire, dropped objects, live operations, high voltage electrical, etc.

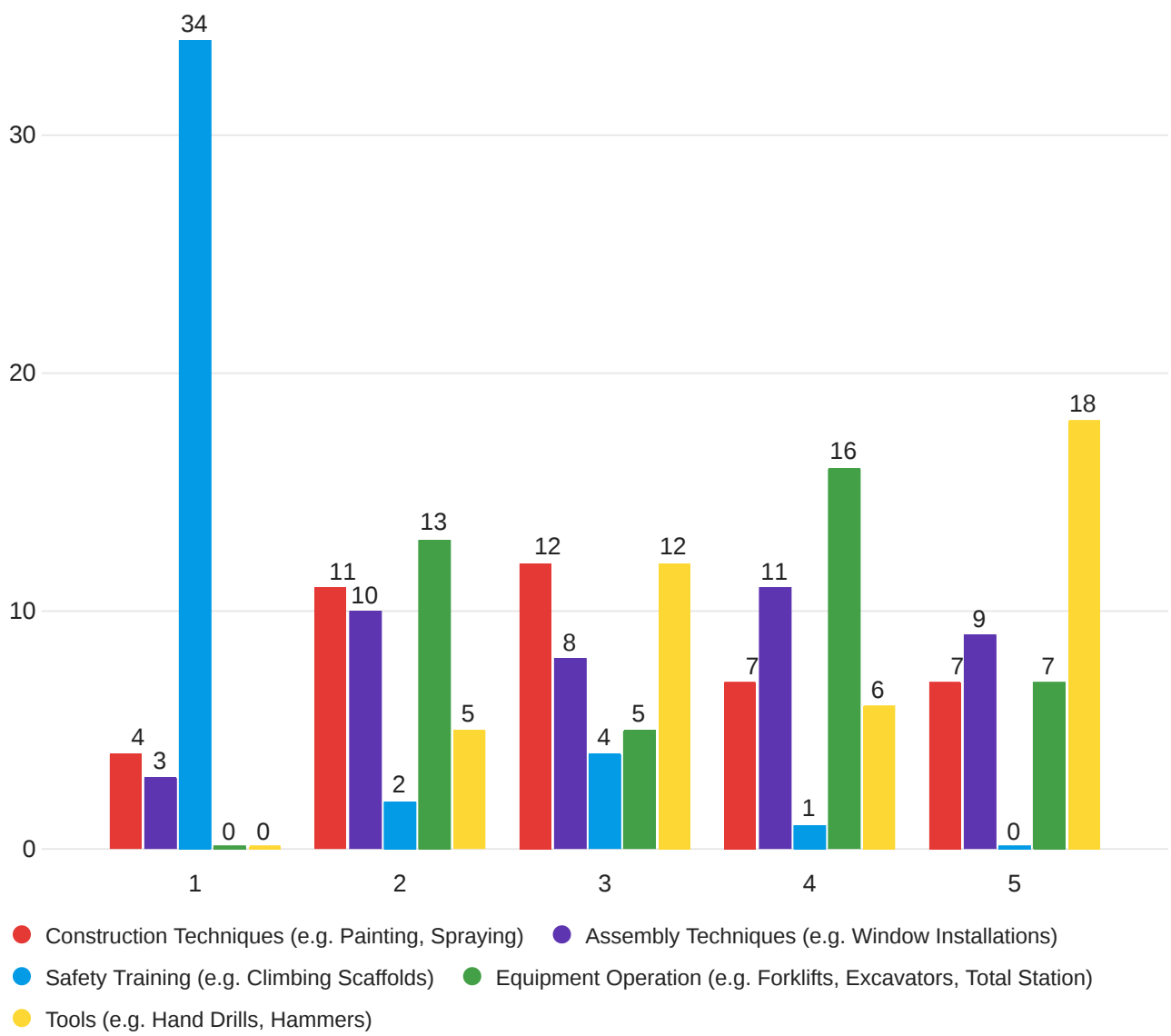
Q13 - Rank the following training programs according to their degree of importanc...

Field	Min	Max	Mean	Standard Deviation	Variance	Responses	Sum
Construction Techniques (e.g. Painting, Spraying)	1.00	5.00	3.05	1.23	1.51	41	125.00

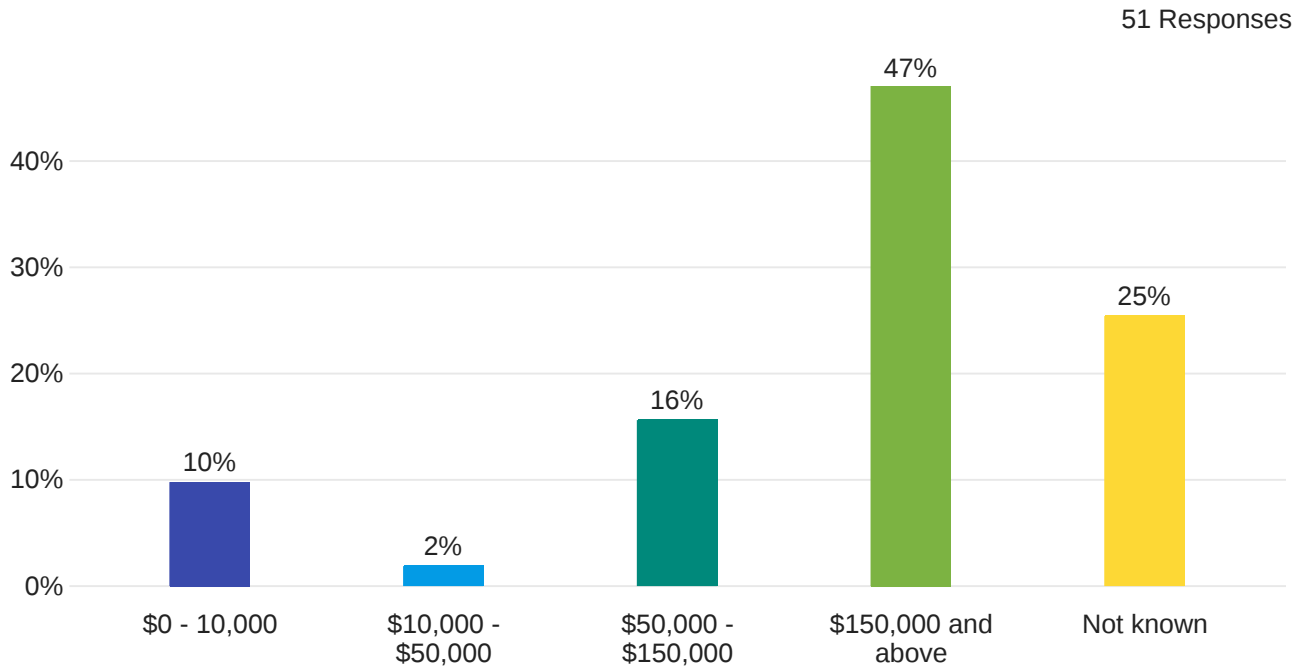
Assembly Techniques (e.g. Window Installations)	1.00	5.00	3.32	1.26	1.58	41	136.00
Safety Training (e.g. Climbing Scaffolds)	1.00	4.00	1.32	0.75	0.56	41	54.00
Equipment Operation (e.g. Forklifts, Excavators, Total Station)	2.00	5.00	3.41	1.10	1.22	41	140.00
Tools (e.g. Hand Drills, Hammers)	2.00	5.00	3.90	1.10	1.21	41	160.00

Q13 - Rank the following training programs according to their degree of importanc...

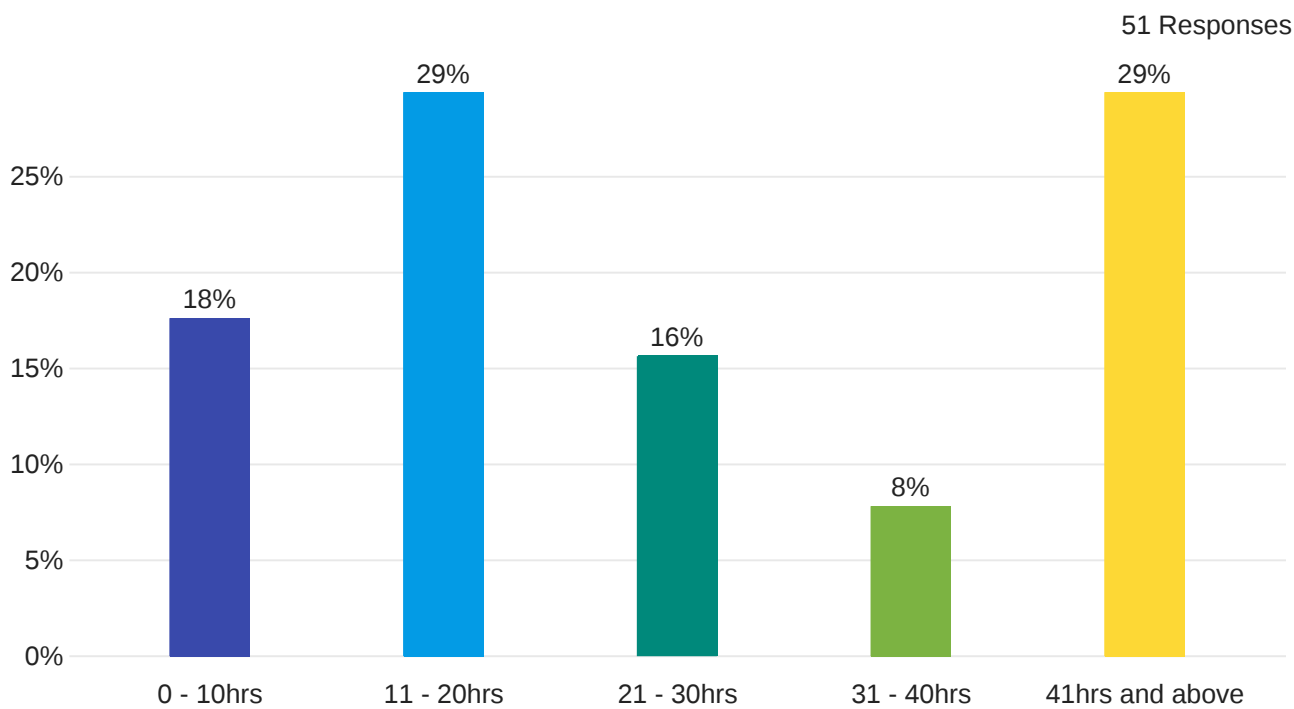
41 Responses



Q14 - What amount of your company's annual budget is allocated to training?

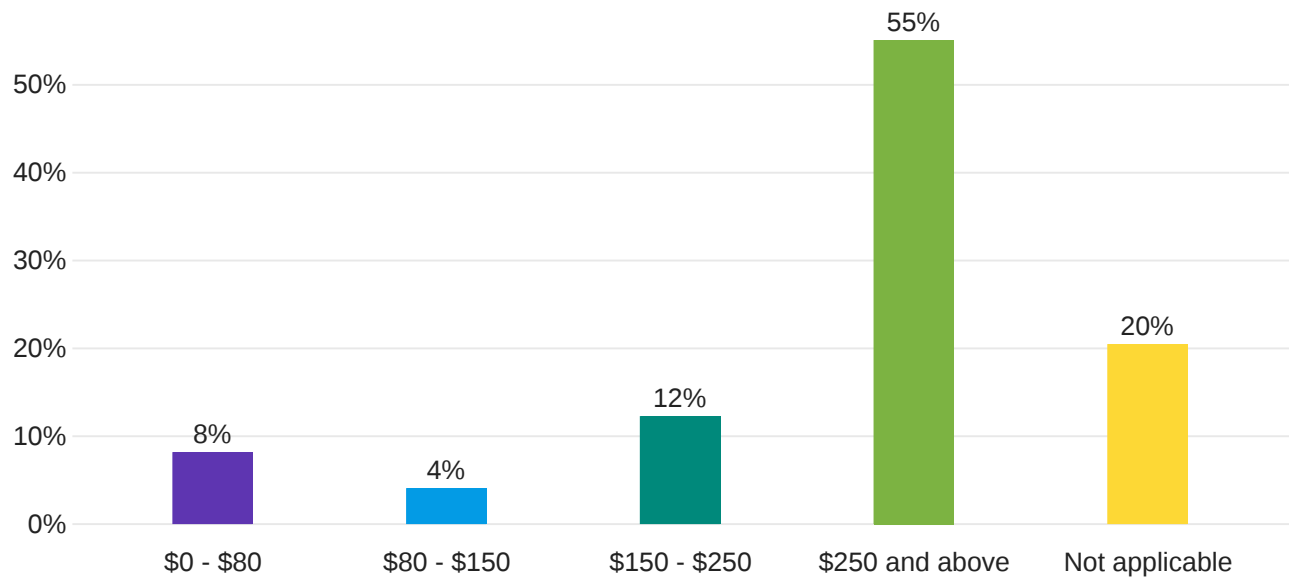


Q15 - Approximately how many hours per year does your company allocate for each employee training?



Q16 - How much is your company willing to invest in construction training per employee per year?

49 Responses



Q17 - How does your company currently implement assembly training?

How does your company currently implement assembly training?
N/A
No
Swinerton has a self perform drywall team. That team conducts trainings in the evenings for the craft team to improve their skills & processes associated with different drywall assemblies or other associated assemblies.
We have a 3rd party assist us in training.
In house training and thru Subcontractors
Boot camp to on board OSHA classes for all new hires On line as well as lab training
Monthly trainings in certain subjects-window installation, concrete, siding installation, fastener installation, weather barrier installation techniques
Work Sessions in the Field with our Sr Superintendent once per month
N/A
Utilize Workday as a platform and assign required trainings to each individual depending on title and requirements of that title.
N/A- FYI, on the previous screen it wouldn't let me rank.
On the job training in the field
N/A
quarterly meeting with our staff to address means and methods.
We are a general contractor, so we largely focus on corporate training and on-site training related to organization policies/procedures.

Studying
Physically assemble
Long term on the job training through experience.

Employees are trained on site by crew foremen and leaders on best practices

It is primarily done on the job

We have industry professionals come and show us proper techniques on how to use and install their products

In person and on an online platform.

On the job instruction

On hands training by leads and supervisors.

Subcontractor & specialty trade classes on site with equipment.

No current assembly training; products are assembled by others

I am not sure because I do not work in the field so I am not as involved.

We are an owner company. We employ contractors. So, such training is provided by our company.

No idea

Videos, Diagrams, Mockups, Photos, Site Visits.

A very poorly executed instruction manual, it is my professional opinion that the “training” document was just put together as a need to fill a box.
The company is not interested in education of the contractor, they should be…

Web Based Training & Classroom Training

N/A

Written procedures, JSA and Work Instructions

Currently only a few assembly trainings for entry employees

At Hensel Phelps, we approach assembly training through a combination of methods to ensure a comprehensive and effective learning experience. We utilize a mix of hands-on practical sessions, interactive workshops, and digital resources such as online modules and video tutorials. Our training programs are designed to cater to different learning styles and levels of expertise within our team. Additionally, we encourage regular knowledge-sharing sessions among team members to foster a collaborative learning environment. This approach allows us to adapt to evolving technologies and industry best practices, ensuring that our assembly processes align with the latest standards and efficiency benchmarks.

Not understanding what assembly training is

Hands on training, driven through contractor programs, safety initiatives

Not applicable

Our company implements assembly training by investing in our personnel to get a better product from their employees

Notify employees of upcoming trainings.

N/A

N/A

Q18 - What are the difficulties/issues you have encountered in assembly training?

What are the difficulties/issues you have encountered in assembly training?
N/A
N/a
Schedule & attendance.
Lack of companies that do this type of specialized training for our sector.
Creating a training that is effective for everyone in the room. Either being too Complex or not complex enought for some.
None
N/A
Lack of knowledge and competency in the subcontractor's work forces: foremen are NOT experienced
N/A
Virtual options are not worth the time.
N/A
language, focus
N/A
We can review the drawings but we need to have some tangible mock-up for staff to put their hands on and understand how it comes together.
N/A
Engaging Lack of Belief
The fast paced environment of our industry limits available time for on site training
Proper training for quality installation
Making sure installers know the correct processes
Too busy to attend trainings.
Follow-through
Just the learning curve required to assemble molds and rebar for the pre-fabriated pieces we manufacture.
Avoiding waste & coordinating scheduling.
n/a
We are an owner company. We employ contractors. So, such training is provided by our company.
No idea
Implementation across the complexity and scale of our projects
Intellectual property is a difficult item to extract and document. Videos that are reviewed and verbal documentation put to each step is critical. The current documentation does not answer 50% of the questions or actual installation.

Not interactive, easy to be bored

N/A

Distractions and Employee Rotation

The trainings are low level information

We have encountered a few challenges during our assembly training initiatives that we actively work to address. One notable difficulty has been ensuring uniformity in the training experience across diverse skill levels within our team. Balancing the needs of both new hires and experienced team members can be complex, requiring us to tailor training content accordingly.

Another challenge is staying up-to-date with rapidly evolving technologies and industry standards. Keeping our training materials and programs current requires continuous effort and adaptation. Additionally, we recognize the importance of feedback loops to refine our training methods, and at times, soliciting and incorporating feedback promptly has been a logistical challenge.

Moreover, ensuring that the assembly training seamlessly integrates with our broader workflow and production schedules has been an ongoing consideration. Maintaining a balance between effective training and minimizing operational disruptions is a constant focus.

Despite these challenges, we remain committed to refining our assembly training processes, leveraging technology where possible, and fostering a culture of continuous improvement to ensure our team is well-equipped and our assembly processes are optimized.

Consumable materials utilized to provide sufficient enough assembly training; wasted materials - hands on during installation, on the job is more efficient but has more hazard risks than in "lab" environment

Not applicable

Finding the time in a work week to spend time to train personnel.

1. Getting employees to attend the training.
2. Communication (language barrier)

N/A

N/A

Q19 - How does your company currently assess the effectiveness of assembly training?

How does your company currently assess the effectiveness of assembly training?

N/A

N/a

survey's & open feedback from employees

Internally as well as 3rd party.

We currently only follow up with reviews and One on Ones to see how effective the training was for each individual. This is an area where we can improve greatly.

Increase in productivity

Site visit inspections, exterior mock up reviews

QA/QC verifications: it starts with accurate bid leveling on bid day, precise scope reviews with bidders before contracts issued, subcontractor prequalification process before contract issued, thorough submittal reviews, preinstallation meetings with subs and their foremen, preinspections in field during installations, A/E inspections during field installations

N/A

Unknown

N/A

QC program

N/A

Performace in the field.

On-site evaluation

Shop and field inspections.

Performance is tracked by crew foremen and superintendents. There are no written metrics for tracking.

quality control checks and cost analysis

QA the finished product and redo as needed

Feedback from the employees.

Constant reviews

Hours spent to complete assemblies as well as safety/quality KPIs.

Very important and could be improved in the industry.

n/a

We are an owner company. We employ contractors. So, such training is provided by our company.

No idea

Internal and External QA/QC monitoring

When there is a problem it becomes important, and it is addressed.
However to update documentation would take time and it’s not done.

Site Audit

N/A

Walk through and pictorial instructions

They do not

We employ a multi-faceted approach to assess the effectiveness of our assembly training programs. Our evaluation methods are designed to provide comprehensive insights into individual and team performance. Key components of our assessment strategy include:

Performance Metrics: We track key performance indicators related to assembly tasks, such as accuracy, speed, and efficiency. This quantitative data allows us to measure the direct impact of training on the proficiency of our team members.

Feedback Mechanisms: We actively seek feedback from participants at various stages of the training process. This includes post-training surveys, focus group discussions, and one-on-one feedback sessions. Gathering insights directly from those undergoing the training enables us to make targeted improvements.

On-the-Job Performance: We observe and evaluate how well the skills acquired in training translate to on-the-job performance. This real-world application is a crucial aspect of our assessment, ensuring that training aligns with the practical demands of our assembly processes.

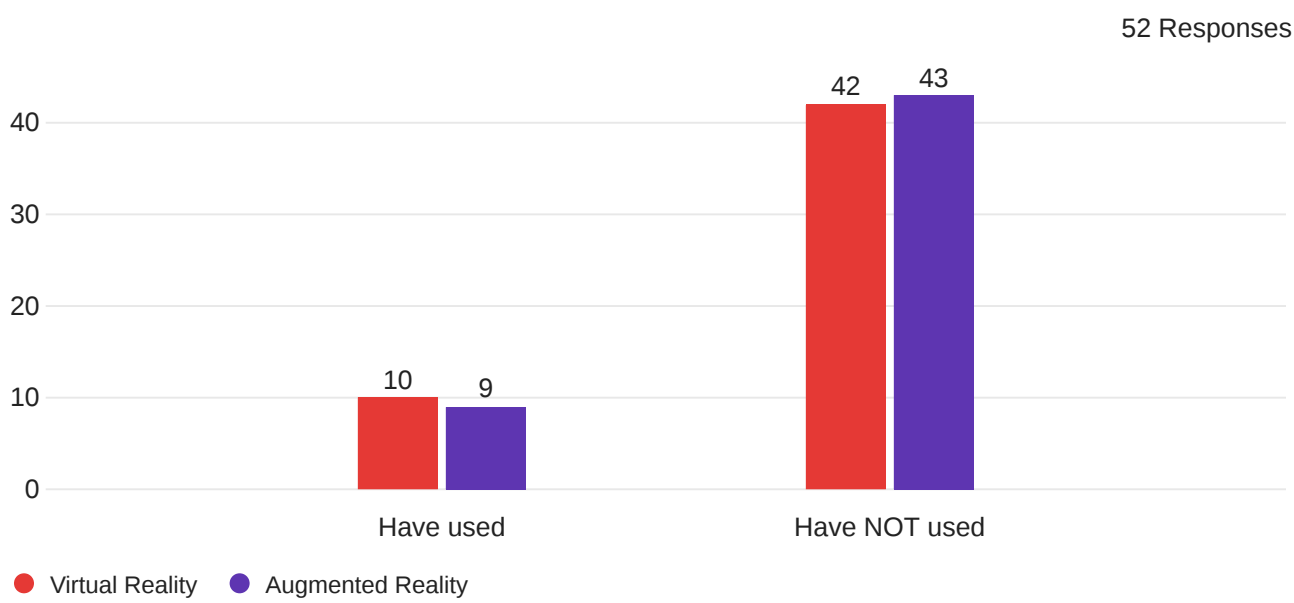
Continuous Monitoring: Our assessment is an ongoing process. We continuously monitor the performance of our team members, allowing us to identify trends, address emerging challenges, and adapt our training strategies as needed.

By combining these methods, we aim to create a comprehensive picture of the effectiveness of our assembly training initiatives. This holistic approach enables us to make data-driven decisions to continuously enhance the quality and impact of our training programs.

Supervision oversight assesment of hands on installation
Not applicable
1. Production efficiency 2. Meeting or exceeding project deadline
N/A
N/A

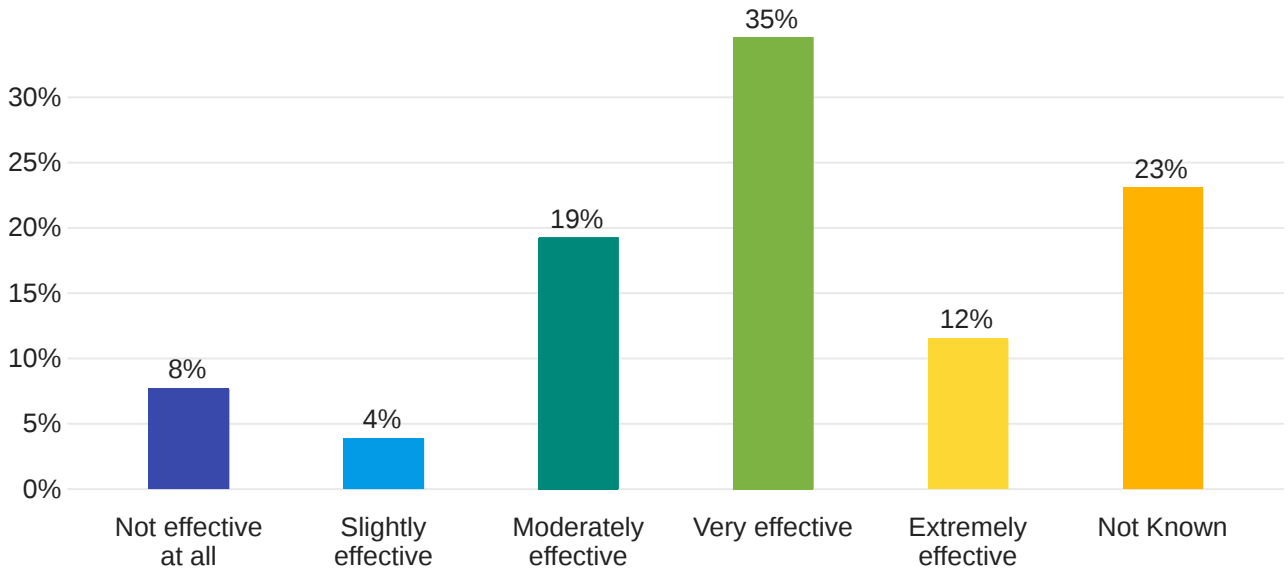
Q20 - Have you used any VR and AR in your training programs?

Field	Min	Max	Mean	Standard Deviation	Variance	Responses	Sum
Virtual Reality	1.00	2.00	1.81	0.39	0.16	52	94.00
Augmented Reality	1.00	2.00	1.83	0.38	0.14	52	95.00



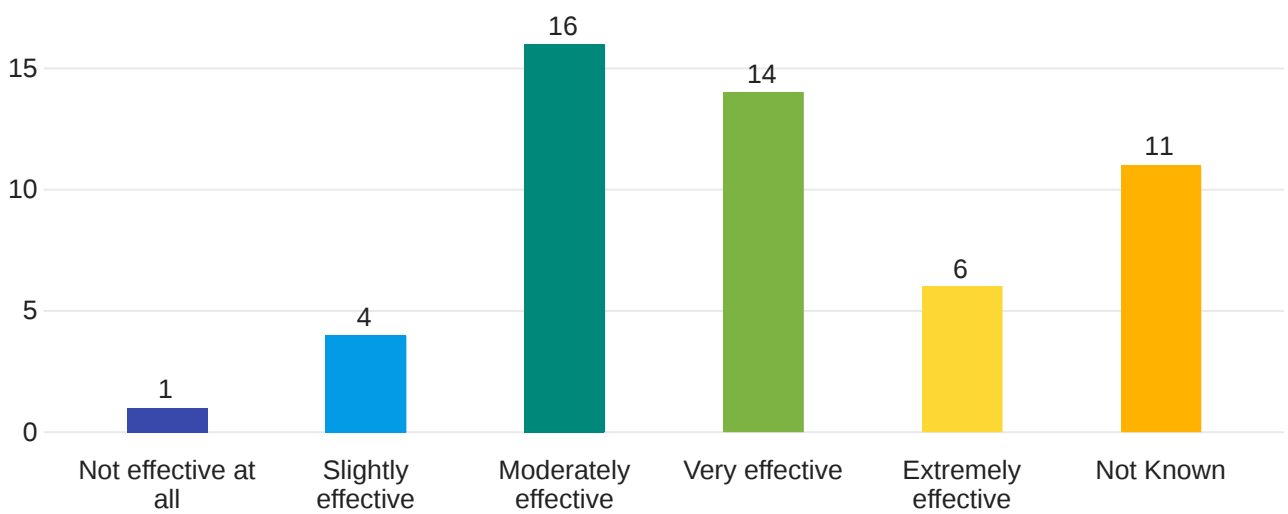
Q21 - How effective do you believe AR/VR is in providing training for safety (e.g. Climbing Scaffolds)?

52 Responses



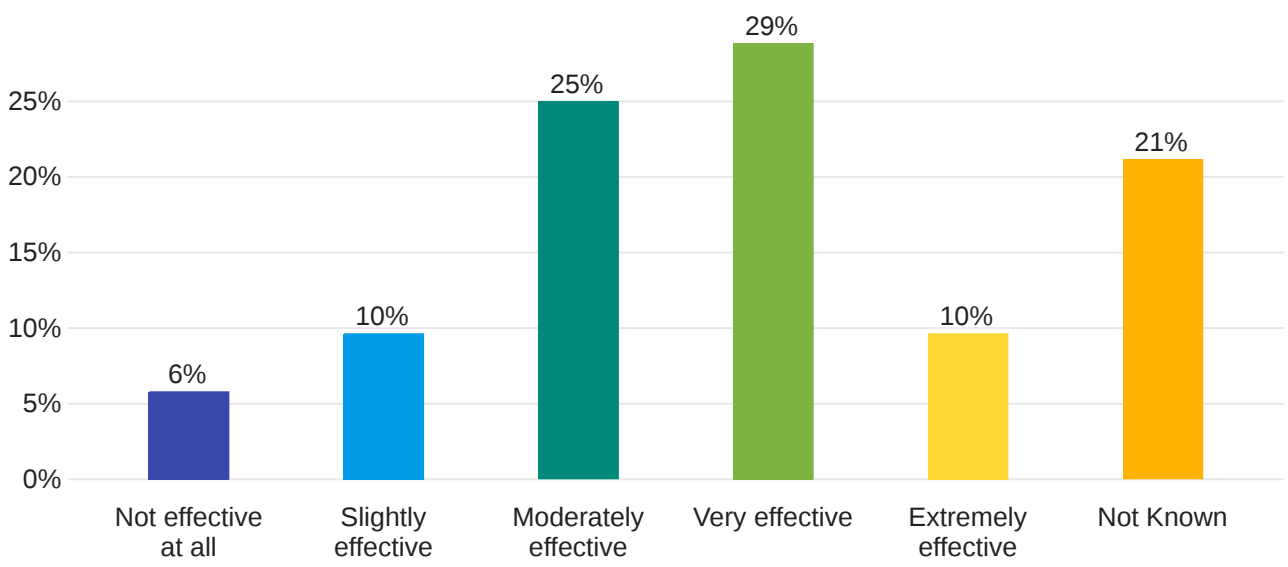
Q22 - How effective do you believe AR/VR is in providing training for equipment operation (e.g. Forklifts, Excavators, Total Station)?

52 Responses



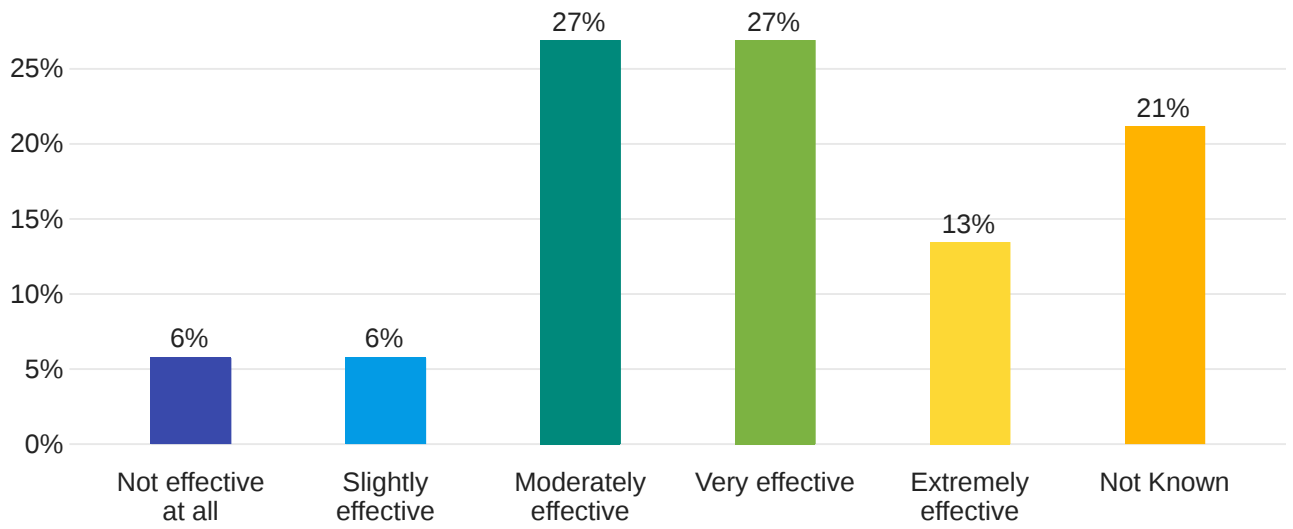
Q23 - How effective do you believe AR/VR is in providing training for construction techniques (e.g. Painting, Spraying)?

52 Responses



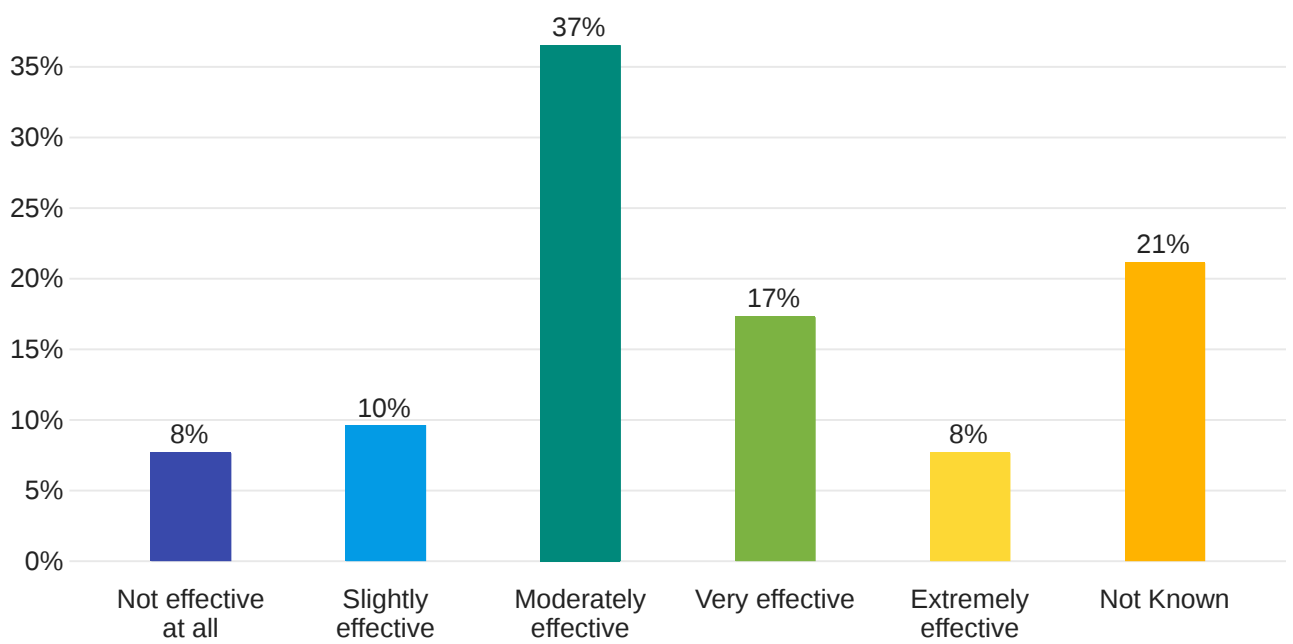
Q24 - How effective do you believe AR/VR is in providing training for assembly techniques (e.g. Window Installations)?

52 Responses



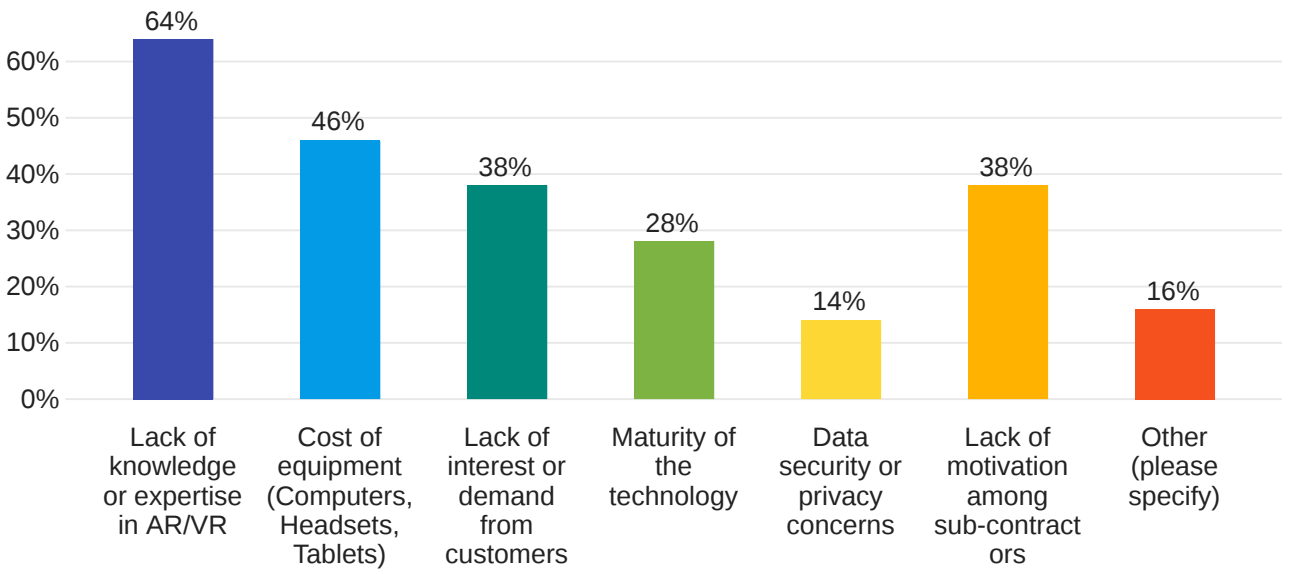
Q25 - How effective do you believe AR/VR is in providing training for Tools (e.g. Hand Drills, Hammers)?

52 Responses

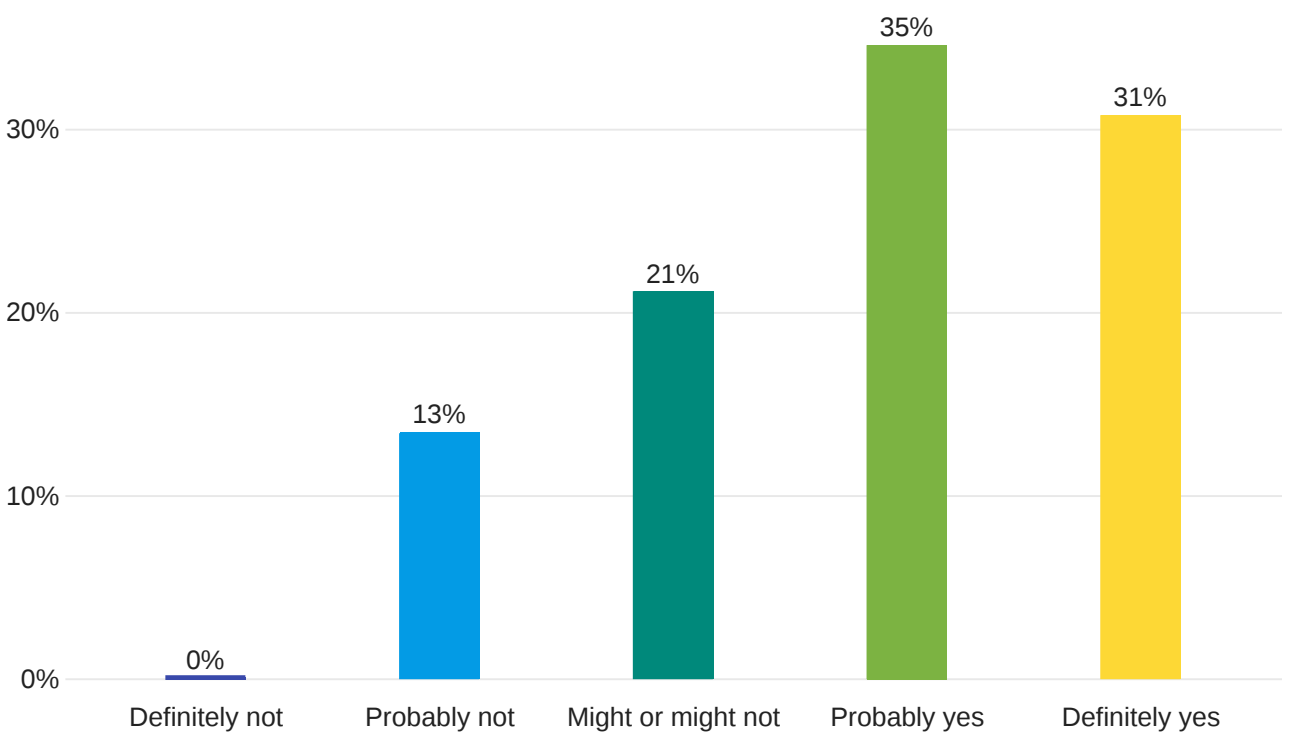


Q26 - If your organization is not already using AR/VR technology for training, what factors are preventing you from doing so? (Select all that apply) - Selected Choice

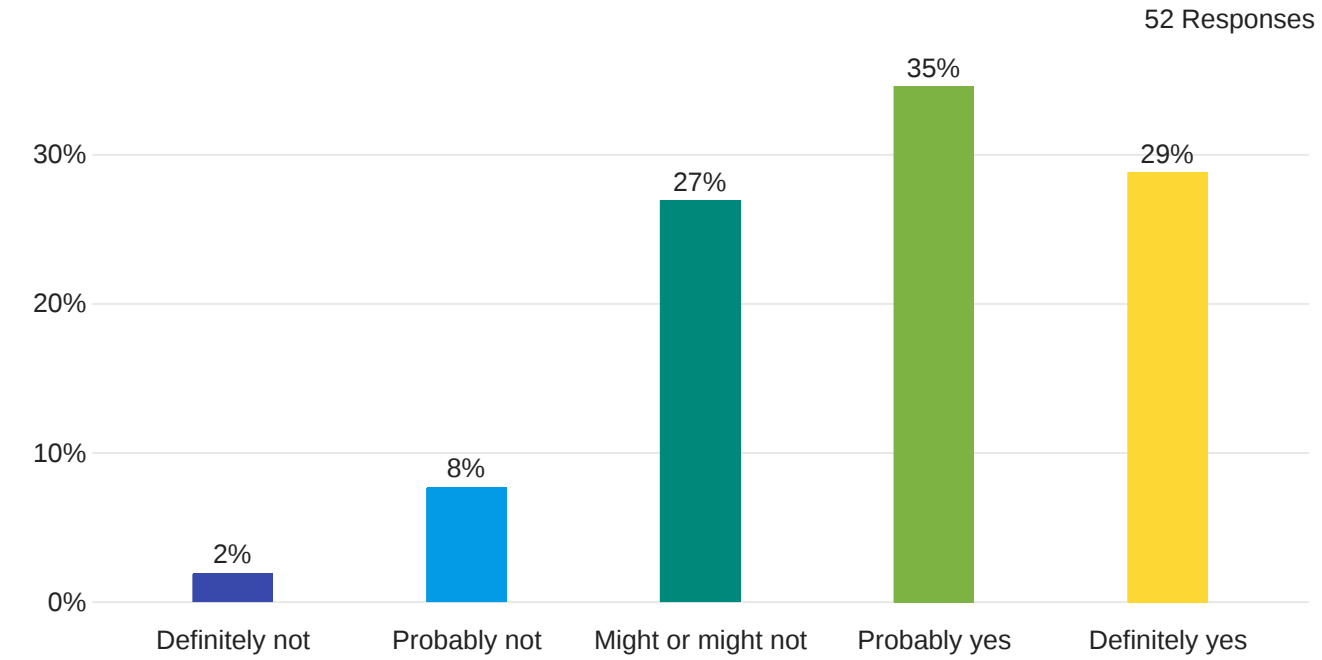
50 Responses



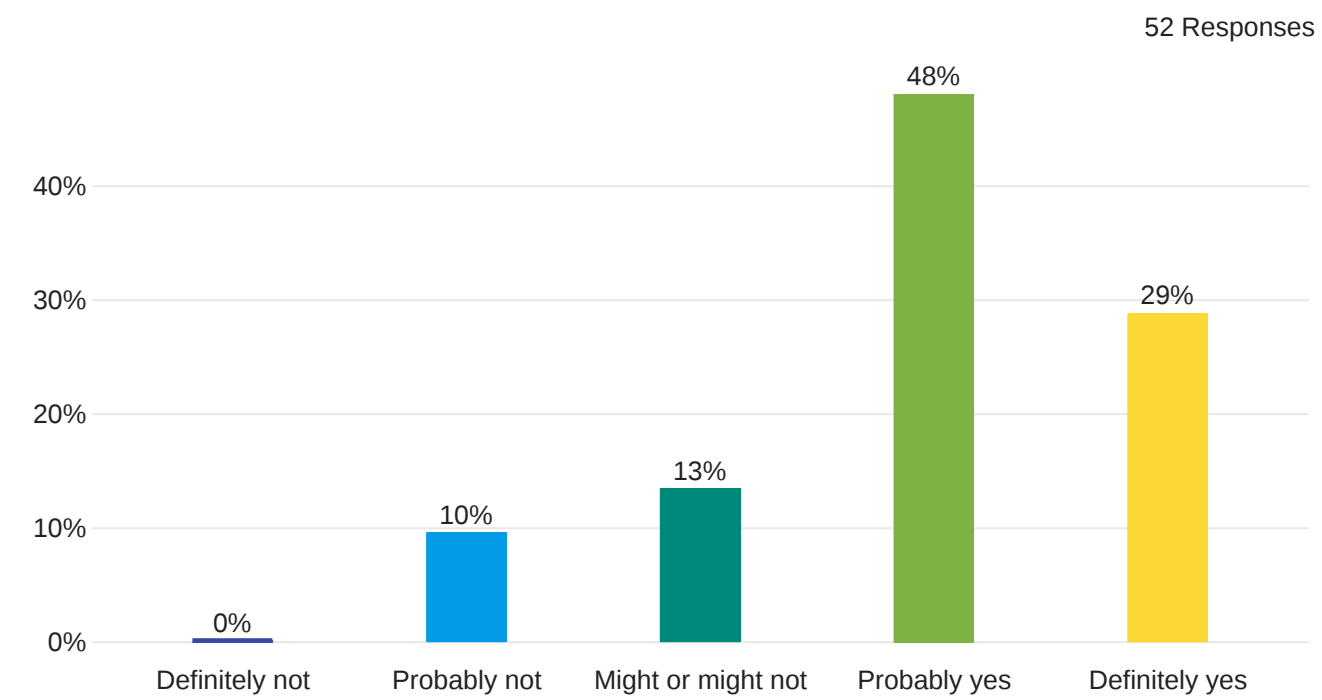
Q27 - Do you think that your professionals will need training in construction robotics?



Q28 - Do you think that your professionals will need training in artificial intelligence?

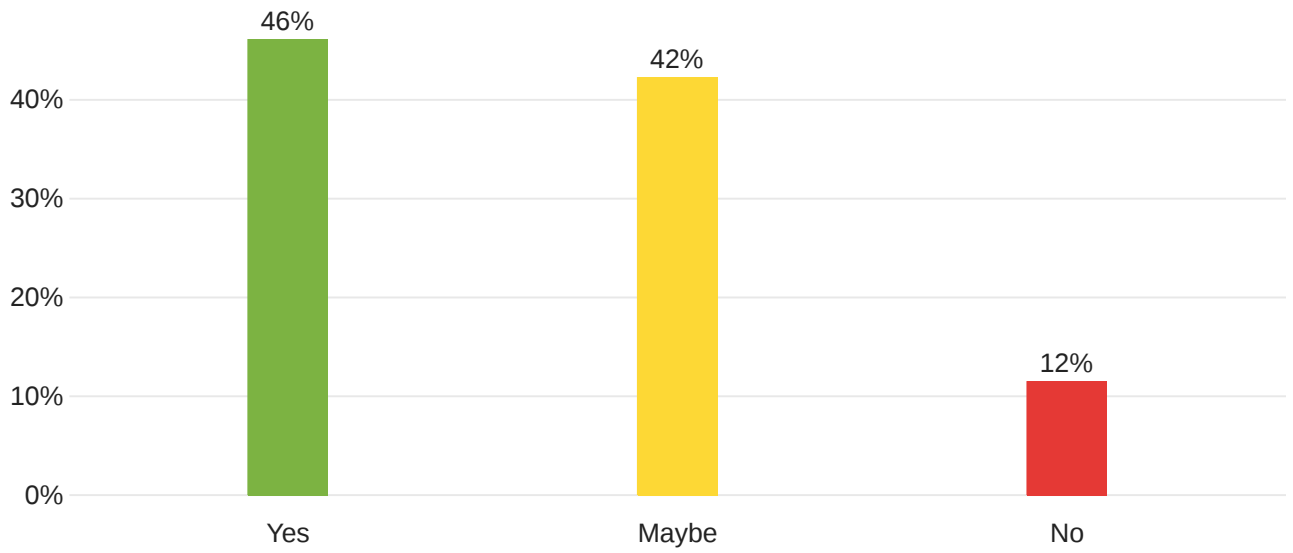


Q29 - Do you think that your professionals will need training in AR/VR/MR (augmented, virtual and mixed reality) technologies?



Q30 - Would you consider wearing or asking your workers to wear an AR/VR headset and follow assembly instructions through AR/VR training?

52 Responses



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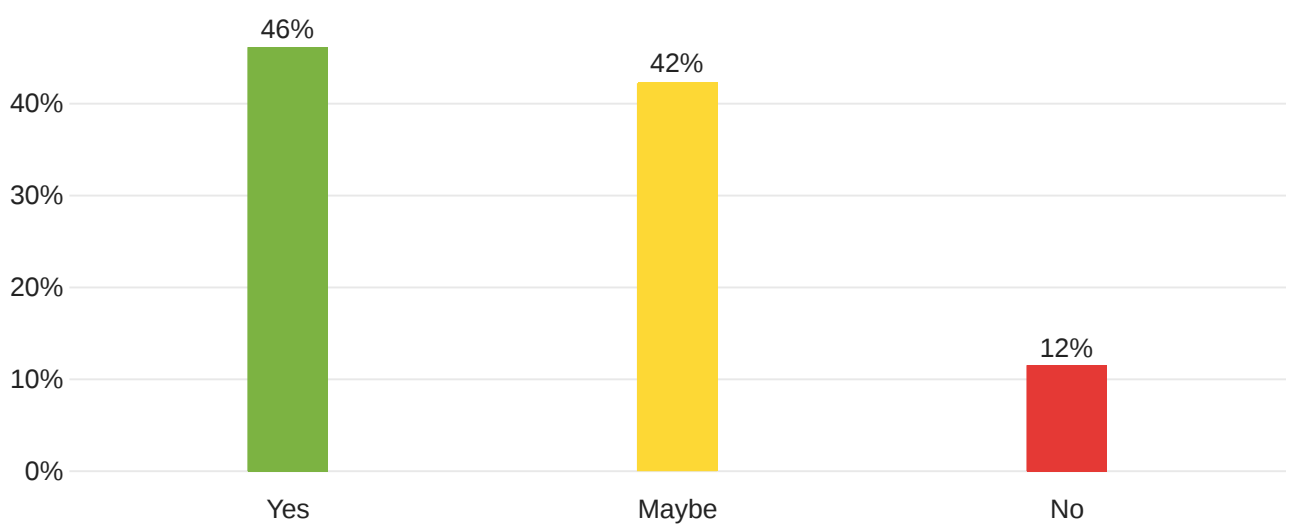
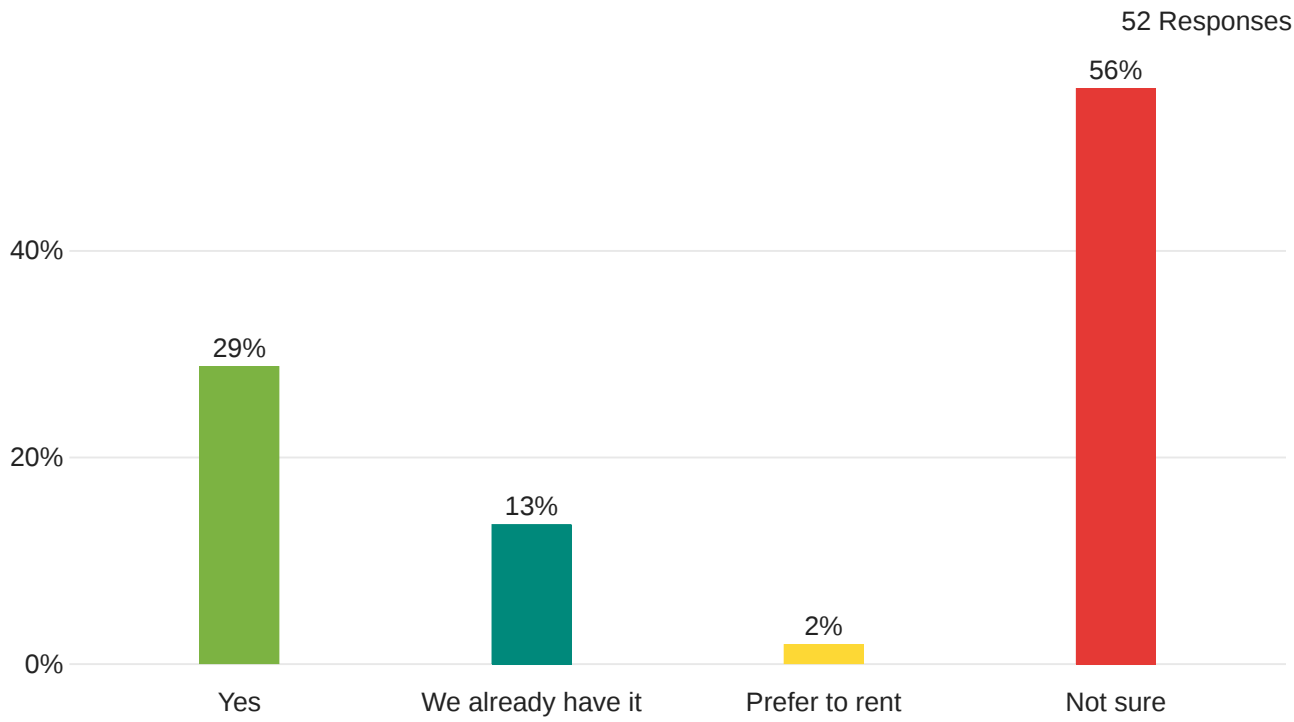
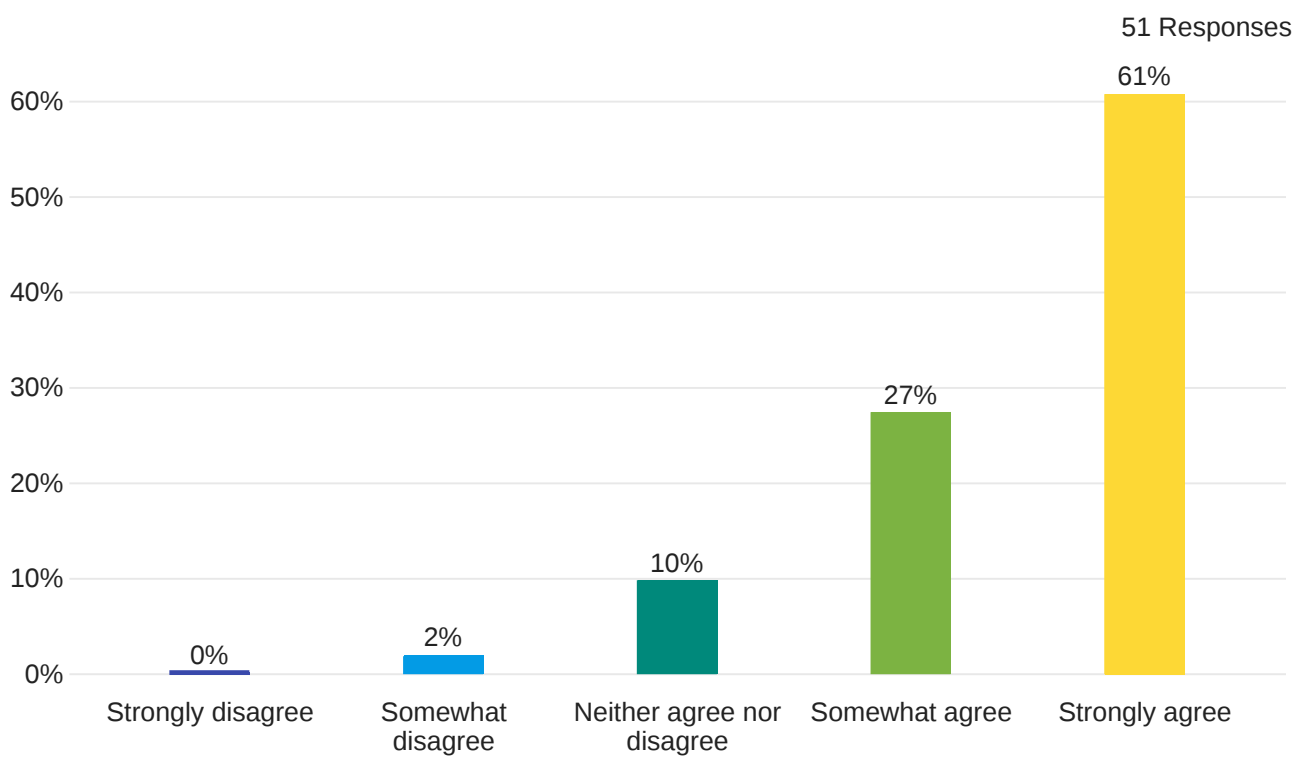


Q31 - Would your company consider owning AR/VR hardware?



Q32 - What do you think about this statement - "Overall, advanced technologies can improve training in the AEC industries".



Q33 - Provide further explanation to your answer in the last question.

Provide further explanation to your answer in the last question.

I believe it is a great too make workforce ready for tool and assembly use, especially in a time where hands-on work isn't as popular. To be able to build the next line of field workers AR/VR will be a really useful tool. With regards to design & constructability standpoint, it would be a great tool for client presentations and make design/constructability decisions early on and in a timely manner.

I am not sure where I see the benefit of this in our sector of the construction market.

I think its improtant to use the latest and greatest technologys to train people becuase the new people that are coming into the industry are using this technology everyday and its something that will be more comfortable and easily accepted.

I think hands on training is better in this industry than AR/VR training

I think the potential is there but yet unproven.

Lack of knowledge in these advanced technologies

The augmented reality will never be the actual reality of being on the job site.... there are many more factors that will vary from being in a controlled environment utilizing AR/AI.

Technology is disrupting the construction industry in a positive manner, and being aware of/cognizant of the most recent technologies will help those succeed within the industry.

The more ways and types of ways and time spent on training will ultimately improve training. VR is helpful as it give visuals and scenarios.

Advanced tech can definitely improve training by putting employees in situations in more controlled environments, however it will take more time for the tech to mature before it becomes adopted across the entire industry

We have not used it, but I think it would be good

Our company does our best to stay on the cutting edge of technology to help make our employees more efficient and more accurate.

Don't know enough about it to formulate a decision.

We acknowledge the benefits that advanced technology has on our industry and markets, but the complications must be worked out first.

Construction is always behind in technology compared to other job fields. I believe as other companies adopt it construction will see the value in using this for training or any other subject manner. Visualization is a hard thing for construction companies to convey when talking about future issues so this could also really help with that.

I believe advance technologies can improve training, but hands on training is the best training.

Owners are finding new ways to accelerate the overall construction so that they can start production. In order to achieve this, technologies must be used as it would save a lot of time when lot of activities are going in parallel.

I believe advanced technogies can help improve training in the AEC industries to help site workers understand what needs to be done and the hazards associated with it before doing the job

I think that Robotics will start to have an impact in construction but is likely farther away from general use than headline news articles indicate. I think AR coupled with a solid BIM model can help with visualization and training on jobs meeting a certain threshold of complexity and budget but aren't the one size fits all best fit solutions that they are often portrayed to be by overly credulous visionaries or salespeople.

Most installer regardless of industry are 3d thinkers, that is why they are typically very good at what they do.
Asking them to verbally communicate what they are seeing and correcting the gaps is extremely affective.
The reason is each professional that reviews the VR will find the gaps, help to fill them and then the communication will be complete.
When you take a tenured professional and ask them to review you will get a more complete review. Then taking that documentation and asking the next professional in line with tenure that is below to review they will comment to what they learn from the gaps, this then can be used to effectively train at each level of expertise.
In most training this is the type of communication that is done during learning.
The carpenters Union actually does this type of instruction.
They use VR when given to do training, this is highly effective as they document in the way they cultivate new talent into their Union training centers.

We should adapt with technology.

The construction industry is poised to adopt technology exponentially in the coming years.

Technology helps us work effectively, increase productivity and safety reliability.

I think VR/AR would be extremely helpful in training without putting people at risk of injury and equipment at risk of being damaged by first time users. Along with being able to train employees on a certain topic at any time rather than having to wait till a certain point in a project to learn about specific construction processes.

The integration of advanced technologies in training for the AEC industries can lead to more effective, efficient, and adaptable learning experiences, ultimately contributing to the continuous improvement of professional skills within the sector.

I think bringing in virtual reality training would help the Company better communicate key EH&S risks.

Have not seen, so unsure if effective or how to judge effectiveness

We are lacking training in our industry leading to more injuries, less production and more rework.

More of a real life experience